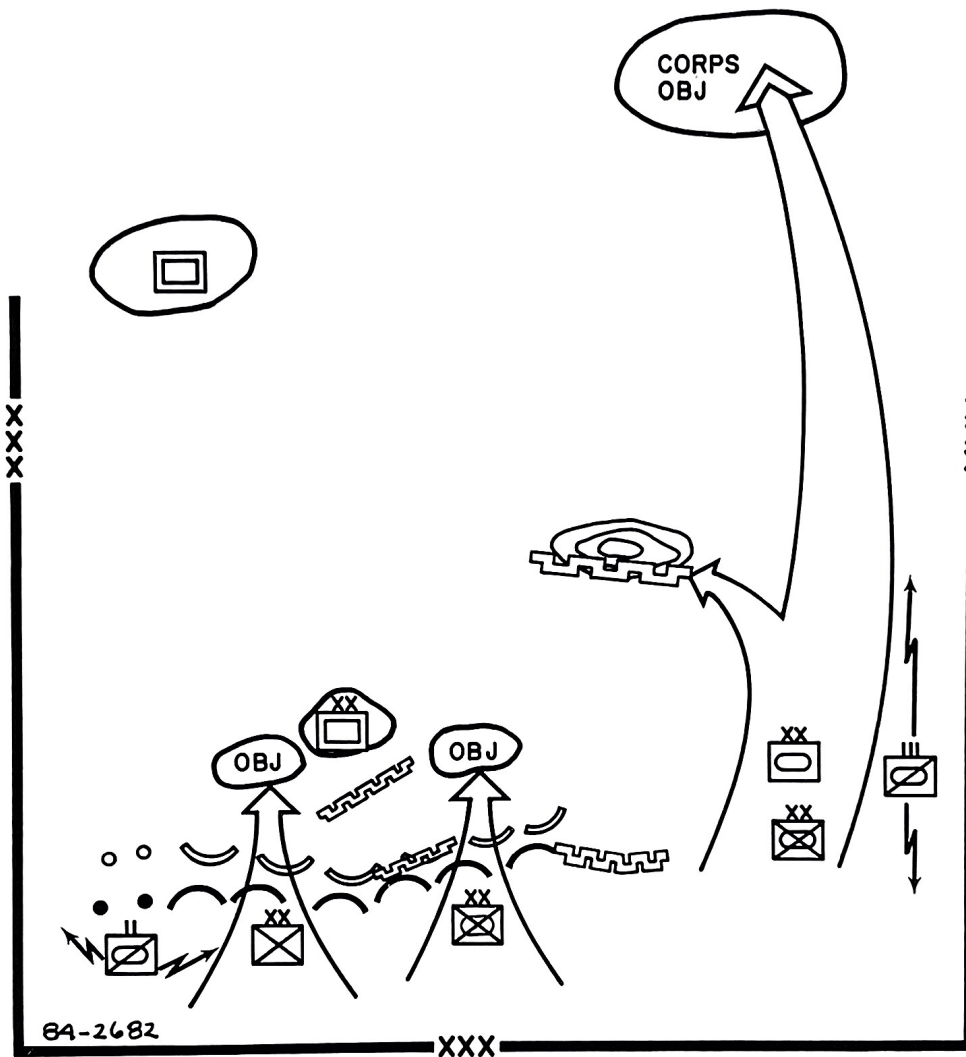


CGSC

Trevor:
You need to
read Corps OPLANS
1 & 3 after this

~~84-1788~~
A332

CORPS OPERATIONS



ACADEMIC YEAR 1983-84

U.S. ARMY COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS 66027

84-A332-1788 (D)

3 AUG = M-Day
17 AUG = D-Day

CORPS OPERATIONS

Advance Sheet

SCOPE

This course focuses on war fighting at corps level using a European scenario as a basis for study. The US troop list is notional and reflects the Transition to the Army of Excellence type US units expected to be assigned to USAREUR in 1986. The unilateral doctrinal base for P315 is FM 100-5, Operations; Field Circular (FC) 100-15, Corps Operations; FM 101-5, Staff Organization and Operations; FM 63-3, Combat Service Support Operations (Corps); FM 34-20, Military Intelligence Group (Combat Electronic Warfare and Intelligence) (Corps); and RB 100-34, Operations on the Integrated Battlefield. NATO follow-on forces attack (FOFA) procedures as expressed in Offensive Air Support Operations, ATP-27(B), will be applied during the practical exercises. FOFA procedures parallel the intent and concept of the US unilateral Joint Attack of the Second Echelon (JSAC) doctrine. Our intent in P315 is to emphasize the operational level of war by studying those AirLand Battle war fighting functions performed at corps level so that we are ready to practice the tactical level of war fighting when we study division operations in P316.

TERMINAL LEARNING OBJECTIVES

A. TASK: Describe US corps-level AirLand Battle doctrine.

CONDITION: Orally and in writing, without references, acting as a corps staff officer.

STANDARD: Explanation must be in accordance with (IAW) FM 100-5, Operations; FC 100-15 (Coordinating Draft), Corps Operations; RB 100-34, Operations on the Integrated Battlefield; and, as a minimum, include an emphasis on: (1) Unified air and ground operations; (2) The nonquantifiable elements of combat power; (3) Operational versus tactical levels of war; (4) Synchronization of all elements of combat power; (5) The application of initiative, depth, and agility.

B. TASK: Describe the organization and command structure for a forward deployed corps in a NATO environment.

CONDITION: In writing, acting as a corps staff officer.

STANDARD: IAW advance sheet appendixes on the NATO chain of command; the NATO offensive air support procedures; and FC 100-15, chapter 2.

C. TASK: Describe the corps combat service support (CSS) system.

CONDITION: Orally and in writing, acting as a corps or COSCOM staff officer, given classroom instruction and course reference materials.

STANDARD: As a minimum, discussion must include the functional areas of supply, transportation, maintenance services, and medical and personnel systems as outlined in FM 63-3, and course lectures.

D. TASK: Evaluate the US corps-level command and control architecture.

CONDITION: Given a tactical scenario, as a member of the corps staff, using assigned references and class notes.

STANDARD: Evaluation will reflect consideration of the command and control system planning factors, organizational constraints, and the impact of the factors of MEET-T, consistent with assigned readings and classroom notes.

E. TASK: Prepare operations estimates for a forward deployed corps.

CONDITION: Acting as a corps G3 in a practical exercise, given a scenario, mission, situation, troop list, and maps.

STANDARD: The estimates will be IAW FM 101-5, chapter 5, and will reflect: (1) the results of mission analysis; (2) conformance with the commander's guidance; (3) development, analysis, and comparison of at least two alternative feasible courses of action; (4) a recommended course of action; (5) synchronization of all available supporting assets; and, (6) sound tactical judgment through conformance to doctrine, principles of war, imperatives of modern combat or, where conformance does not exist, an analysis and realization of the risks involved.

F. TASK: Develop intelligence estimates for a forward deployed corps and utilize intelligence products in support of the decisionmaking process.

CONDITION: Orally, graphically, and in writing, while acting as a corps staff officer, given classroom instruction and course reference materials.

STANDARD: Estimates will be prepared IAW FM 101-5 and FM 34-1. The intelligence preparation of the battlefield (IPB) process will be incorporated into the developmental effort in the form of situational, event and decision support templates. This, along with weather and terrain analysis, provide the basis for conclusions on friendly and enemy courses of action.

G. TASK: Complete a corps logistics estimate.

CONDITION: Acting as a corps staff officer, orally and in writing, given FM 101-10-1 with change 1, RB 101-5, and classroom instruction.

STANDARD: Estimate must be in the format contained at appendix F, RB 101-5; computations and analysis must be accurate to the degree permitted by FM 101-10-1 with change 1 (chapters 3, 5, and 7); and, accurately assess supply, maintenance, services, transportation shortfalls and provide alternatives IAW parts 2 and 3, FM 63-3, and the student handbook.

H. TASK: Present decision briefings for forward deployed corps operation plans.

CONDITION: While acting as a corps G3 officer during practical exercises, having completed the intelligence, operations, and logistics estimates for a given corps mission.

STANDARD: The briefings must identify the key factors affecting the decision, the details of the corps operation, and the probable capability of the corps to execute future operations in the campaign. Briefing format and techniques will be IAW RB 12-1.

I. TASK: Prepare selected portions of a corps OPLAN or OPORD in order to communicate the commander's decision for a forward deployed corps operation plan.

CONDITON: Given the commander's decision on the corps operation, as homework or an in-class practical exercise.

STANDARD: IAW FM 101-5, chapter 7 and appendix H, and will include as a minimum: (1) task organization, (2) paragraph 2, (3) paragraph 3, and (4) operations overlay; all while considering corps-level C3I planning requirements and deception objectives.

J. TASK: Develop corps FRAGOs.

CONDITION: In a practical exercise, under time pressure, given a situation update that requires a change to the combat orders or a decision to execute a contingency plan in a forward deployed corps.

STANDARD: The FRAGO must be developed in a timely manner IAW FM 101-5 and as a result of the application of the military decisionmaking process.

P315

K. TASK: Develop a personnel and material reconstitution plan for a corps unit.

CONDITION: Acting as a corps and COSCOM staff officer, orally and in writing, given FM 101-10-1 with change 1, and classroom instruction.

STANDARD: Plan must accurately determine personnel and materiel requirements IAW FM 101-10-1 with change 1 and must prescribe alternative solutions IAW USAREUR Pam 525-1.

L. TASK: Describe nondivisional fire support at the corps level.

CONDITION: Orally and in writing, while acting as a corps staff officer, given classroom instruction and course reference material.

STANDARD: Description will include the fire support coordination system and how fire support system supports the close, deep, and rear battles using conventional, nuclear, and chemical munitions.

M. TASK: Synchronize the execution of the corps AirLand Battle.

CONDITION: Given RACO, counterattack, and deep battle plans with a requirement to execute all three simultaneously.

STANDARD: IAW FM 100-5, Operations, and FC 100-15 with modification to the plans such that the execution decision is feasible.

CORPS OPERATIONS

Lesson 1. Introduction to Corps Operations

Appendix 2 to Advance Sheet. Advance Sheet, Lesson 1

SCOPE

6

This ~~2~~⁶-hour lesson is focused on describing the corps-level AirLand Battle doctrine as it is applied during war fighting. Emphasis is on understanding the doctrinal terms and graphics, the assets available, the requirements and organization of the battlefield, the corps support systems that support the doctrine, the command and control process, and key aspects of operating under a NATO command structure. This lesson has seven sublessons.

TERMINAL LEARNING OBJECTIVES*

- A. TASK: Describe US corps-level AirLand Battle doctrine.
- B. TASK: Describe the organization and command structure for a forward deployed corps in a NATO environment.
- C. TASK: Describe the corps CSS system.
- D. TASK: Describe the US corps-level command and control system capabilities and processes.

*The Conditions and Standards for these TL0s are printed on the P315 Advance Sheet.

P315-1

OUTLINE

<u>Lesson No.</u>	<u>Title</u>	<u>Proponent</u>	<u>Hours</u>
1/1	The Corps AirLand Battle	DTAC	5
1/2	Tactical Air Control System and Airspace Control	USAF	2
1/3	Forward Deployed Corps, CENTAG	DTAC	2
1/4	The Command and Control Process	DCOM	2
1/5	Tactical Airlift	USAF	1
1/6	Fire Support Coordination	DCOM	2
	Examination	DTAC	1
1/7	Corps Support Systems	DCS	11
		TOTAL	<u>26</u> Hours

CORPS OPERATIONS

Lesson 1. Introduction to Corps Operations

Appendix 1 to Advance Sheet, Lesson 1/1. Tactical Doctrine: Evolution from World War II to 1984 and Self-Evaluation Quiz

1. INTRODUCTION

The keystone army doctrinal manual that is the basis for instruction at the Command and General Staff College (CGSC) is FM 100-5, Operations. The new FM 100-5 no longer addresses "active" and "position" as forms of defense, but instead refers simply to "defensive operations." Defensive techniques range from static to wholly dynamic, based on a thorough analysis of the factors of mission, enemy, terrain and weather, and troops available and time (METT-T). The supporting series of "How to Fight" manuals are all undergoing complete revisions to reflect how to fight the AirLand Battle. The AirLand Battle pertains to both defensive and offensive operations. It stresses the importance of the Army and Air Force fighting a coordinated, jointly planned, and mutually supporting battle to simultaneously interdict threat forces prior to their arrival at the forward line of own troops (FLOT) and on a battlefield where the environment may entail combat with conventional, nuclear, or chemical weapons, or any combination of the three. The thrust of the new FM 100-5 is toward offensive maneuver in the defense aimed at wresting the initiative away from the attacking threat force as rapidly as possible to enable US forces to attain favorable decisive results. With this new thrust, the new manual reemphasizes the many dynamic, but nonquantifiable, aspects of combat power--initiative, deception, surprise, exploitation of battlefield opportunities, psychological aspects and challenges of modern battle--morale, esprit, and state of training.

This part of your lesson defines the term "doctrine;" describes the role, limitations, and importance of doctrine; and puts current defensive doctrine into the historical context of the past 35 years. The successful student of tactics must be familiar with the "doctrinal base" for any subject at hand. For the purpose of studying defensive operations, defensive doctrine must be read, discussed, debated, and applied to achieve a satisfactory level of understanding.

Before studying, applying, and internalizing doctrine, one must know what doctrine is and what it is not. One writer has defined it this way:

"Doctrine is what is officially taught. It is an authoritative rule, a precept, giving the approved way to do a job. Doctrine represents the "tried and true," the one best way to do the job which has been hammered out by trial and error, officially recognized as such, and then taught as the best way to achieve optimum results."¹

Next, understand that US Army doctrine is not dogma. Doctrine, while being accepted as authoritative, must be applied with judgment and is not established as true beyond dispute. Tactical doctrine is derived by a process of generalization. Sources of information drawn on to derive these generalizations include recorded combat experience, full-scale maneuvers, unit exercises, service tests, war games, analyses of data, and verifications of evidence.

Tactical doctrine remains dynamic. To insure this happens, all criticisms, new data, and other comments are fed back continuously into the doctrine writing system for analysis, leading to a reformulation of doctrinal statements.

It is also useful to acknowledge that there are several kinds of doctrine:

"First there is official doctrine, complete with authenticating imprimatur, published in a manual. But then there is the unofficial kind, all those bits and pieces of doctrine, in actuality, the doctrine, sound or erroneous, in the minds of men * * *."²

Doctrine is sometimes criticized as being too general or inadequate because it is oversimplified. But understanding requires theory; theory requires abstraction; and abstraction requires the simplification and ordering of reality. No theory, or doctrine, can explain all the facts, and, at times, the reader may feel that certain concepts or distinctions are drawn too sharply from reality. Yet, logical categories are necessary if the student is to think profitably about the real world in which he lives and to derive from it lessons for broader application and use.

Historically, US Army tactical doctrine, in general, and defensive tactical doctrine, in particular, has evolved very dynamically over the past 35 years. Nuclear weapons, national policy, the balance of power, and the phenomenal growth in technology and lethality of the battlefield all have had major impact on tactical doctrine. Although the offense has remained the primary "war-winning" tactic, defensive operations have undergone more change over time.

¹I. B. Holley, Jr., "The Doctrinal Process: Some Suggested Steps," Military Review, Vol. LIX, No 4 (April 1979), pages 4 and 5.

²Ibid, page 12.

The following summary of changes in US Army defensive doctrine since the end of World War II has been edited from an excellent CGSC Combat Studies Institute paper entitled "The Evolution of US Army Tactical Doctrine, 1946-76.³

2. WORLD WAR II TO THE KOREAN WAR

Defensive doctrine called for what was essentially an area defense. The defense resembled J. F. C. Fuller's "archipelago" defense. Its major purpose was to hold ground "at all costs." Covering forces were placed well forward of the main battle position to delay and disorganize the enemy advance and to deceive him as to the true location of the battle position. The main battle position consisted of a "zone of defense" in which there were a series of occupied defense areas organized for all-around defense. There was a "main line of resistance," but doctrine envisioned a defense in depth rather than a linear concentration of forces. Large reserves, especially large armored formations, were retained to relieve units in the main battle position, to participate in a counterattack, or to occupy a rear position. Relatively immobile infantry-heavy forces in the main battle area, however, were to bear the brunt of the heaviest fighting.

3. KOREAN WAR

Defensive tactics at the beginning of the war were much the same as described above. However, terrain, enemy tactics, and friendly troops available caused new problems. The thinly held defensive lines of the US Army had numerous holes or exposed flanks. Infiltrating enemy units frequently occupied positions to the Americans' rear, striking at command posts, support units and artillery positions. When the Chinese entered the war, they also stressed penetration of weak points and envelopment or encirclement of defensive positions. Because of massive United Nations (UN) air, artillery, and tank support, most Chinese attacks came at night. Early in the war, the shock of initial combat experience and the lack of discipline and training caused retrograde movements to more closely resemble mob movements than military movements. The US Army was also unaccustomed to operating on wide frontages imposed by the shortage of units. Initially, attempts were made to defend in a thin line stretching across the entire defensive area. This caused serious problems in command and control, and defensive positions often lacked necessary depth to halt mass enemy attacks.

³Robert A. Doughty, "The Evolution of US Army Tactical Doctrine, 1946-76," Leavenworth Papers, No 1 (Fort Leavenworth, Kansas: Combat Studies Institute, USACGSC, 1979), pages 1 through 50.

After becoming commander of the Eighth Army, General Ridgway stressed the occupation of strong night defensive positions with all-around protection. By occupying suitable hilltops or ridgetops and permitting enemy penetrations through the valleys, the enemy could be destroyed at daylight by strong combined arms teams of armor, infantry, artillery, and air. Another technique used was one that evolved into the mobile defense. A division's front was lightly outposted, while major forces, often armor-heavy, were held back to counterattack enemy penetrations. Similarly, a greater emphasis was placed on counterattacks that often upset the rhythm of the enemy's operation and enabled the Americans to seize the initiative. Better use of cover and all means of firepower resulted from experience.

While the UN forces normally depended on strong defensive positions supported by artillery and air cover, the Chinese, due to a lack of such support, relied on a more fluid defense, which stressed maneuver. Decisive engagement along a main line of resistance was avoided. The purpose of the defense was not to hold terrain, but to create weaknesses in the attacker's forces that could be exploited by counterattack.

During the large-scale, mass attacks of 1951, the Americans were also forced to use a more mobile form of defense. One such method was called "fight and roll." An inflexible defense had little effect against a mass attack. Waves of troops could charge a position almost faster than they could be killed, and the smallest penetration allowed the attacker to envelop the remaining line.

Under the concept of "fight and roll," the defenders remained in their positions as long as possible--until the enemy had paid the maximum price and before the defensive positions were engulfed by the attackers. After the highest possible cost was levied against the enemy, a rapid and orderly preplanned withdrawal was conducted to a previously prepared defense position. Although the defenders might be forced to occupy as many as five or six subsequent positions, it was "inevitable," according to I Corps, that the surging mass would eventually halt. The I Corps' description of the "fight and roll" defense stated: "Enemy units will be decimated, command and control channels lost, and equipment gone. The mass becomes a struggling, chaotic mixture of the remnants of many broken units."

The defense, however, was not simply one of continually occupying subsequent positions. Local counterattacks were planned and were launched at critical times by tank-infantry teams. Most counterattacks, however, consisted of massive concentrations of artillery fire.

After armistice negotiations began in November 1951, the UN forces refrained from large offensive operations, allowing the war to enter its static phase. American defensive positions were heavily fortified and much more elaborate. Main battle positions were often not based on the strength of the terrain but on the location of the line of contact when armistice negotiations began.

When the Korean war ended in July 1953, the official position was that no real changes in doctrine had occurred nor had been necessary during the war. Despite this disclaimer, a subtle but important change had occurred in Army thinking, if not in its doctrine. The Army had become accustomed to massive amounts of firepower, which came at the expense of mobility. The Army had also perfected its techniques of employing firepower in the defense to inflict huge losses on the attacker. Thus, the Army focused on attrition at the expense of maneuver and its offensive spirit.

In May 1952, the Secretary of the Army officially announced the Army's development of an atomic howitzer.

4. POST-KOREAN WAR: EARLY 1950'S TO MID-1950'S

Korea did not seem worth the price of crossing the atomic threshold, but the experience with masses of Chinese soldiers in Korea was believed to offer many parallels to the possibility of a Soviet attack in Europe.

Following the Korean war, the Army intensified its study of tactics, organization, and equipment for the atomic battlefield. Many military observers believed the new weapons promised an unparalleled revolution in tactics. The US Army Vice Chief of Staff stated in a 1954 speech that "Warfare, perforce, at once becomes dispersed, leading to a wide open, fluid battlefield. Mass, in the old sense of concentrating units and material to achieve a breakthrough or to mount an assault, becomes suicidal. The use of atomic weapons might be as commonplace on future battlefields as heavy artillery is today."

The Army had little choice but to reconsider its methods. Yet it chose to move incrementally and to avoid risking organizational and doctrinal chaos by hasty, wholesale changes. When the 1954 Field Service Regulations (FM 100-5 of that day) were published, the envisioned atomic battlefield was a clear descendant of World War II and Korea. The 1954 edition of the Field Service Regulations stated that there were two basic types of defense--the position defense and the mobile defense.

The position defense was clearly a descendant of previous methods, for it relied on a "zone of resistance" with a number of mutually supporting defense areas organized for all-around defense. The majority of the forces were placed forward, and a reserve, rarely larger than one-third of the force, was retained to counterattack, to occupy blocking positions, or to replace or reinforce troops in defensive areas. The emphasis on a defense in depth also resulted in downplaying the idea of a main line of resistance and replacing it by the idea of a forward edge of the defensive position. Yet, decisive combat was expected to take place in front of or within the forward battle positions.

In the mobile defense, the bulk of the defending force was retained as a "mobile striking force" while the remainder occupied the forward defensive position. In this fluid defense, the forward positions could consist of islands of resistance, strongpoints, or observation posts. They were, nevertheless, not completely static positions since they were not expected to halt the enemy. The idea was for forward forces to canalize the attacking forces and delay or disorganize their attack while the mobile force was "employed in offensive action to destroy the enemy at the time and place most favorable to the defender."

Although the origins of the mobile defense are not entirely clear, the methodology resembles some of the counterattacks or active defenses of World War II. It also bears some resemblance to the defensive operations in Korea when mass attacks had been bled by defensive fires from successive positions until the time was ripe for a counterattack by massed fires or tank-infantry teams. The mobile defense--for the moment--seemed to provide a logical solution to the perplexing and difficult problem of balancing the need for dispersion against the need for mass.

More importantly, there had been a resurgence of enthusiasm for armor in the US Army, following the success of North Korean tanks in 1950 and the growing threat of masses of Russian tanks in Europe. In July 1948, there had been only 1 armored division in the 10 divisions in the active force structure. By 1956, there were four armored divisions out of a total of 20 divisions.

Changes to the 1954 Field Service Regulations appeared in 1956 and 1958, but they did not dramatically alter existing practices. The major thrust of the changes, from the viewpoint of atomic warfare, was to emphasize that an artificial separation between atomic fires and maneuver was not possible. After being appointed Chief of Staff in 1953, General Matthew B. Ridgway strongly emphasized that on future battlefields, American forces "must expect to be outnumbered" and the Army had to multiply its effective strength by increasing its mobility and firepower. There was no doubt that atomic weapons provided the preponderant part of the new firepower.

5. THE PENTOMIC DIVISION

The threat posed by tactical atomic warfare caused the Army to create the pentomic division concept. This concept envisioned a "cellular rather than linear" battlefield. Reorganization of all divisions was deemed mandatory to fight on the atomic battlefield. New communications equipment coming into use offered the promise of increased span of control. An infantry division was composed of five battle groups, with five rifle companies, a combat support company, and a headquarters and service company. The division also included a tank battalion of five tank companies, a cavalry squadron of three troops, five direct support artillery battalions, and one general support artillery battalion. Armored personnel

carriers were maintained under the centralized control of the transportation battalion. The battle group was directly controlled by the division commander or through special task forces of two or more battle groups under an assistant division commander.

Combat units were to be dispersed and organized in "checkerboard" fashion with considerable gaps between units. During defensive operations on the pentomic battlefield, it was envisioned that some penetration by the enemy between the dispersed defensive positions was unavoidable. However, once his attack was disrupted by a series of blocking positions, he would be vulnerable to the defender's atomic weapons or to counterattacks on his flanks or rear. Flexibility and rolling with the punch, rather than rigidity, was to be the keynote of the defense.

An intellectual adjustment was required by the officer corps of the US Army. Prior to academic year 1957-58, almost all CGSC instruction portrayed general war in a World War II-type environment. In 1957-58, the College curriculum underwent sweeping changes. Tactical problems were placed in settings throughout the world. In 1957-58, the atomic battlefield became the standard while the conventional battlefield became the exception. These changes forced a complete reversal of many established practices. The Army probably has never experienced a more radical change during peacetime in its thought, doctrine, and organizations. However, command and control, communications, mobility, and firepower problems associated with this concept caused its demise in the early 1960s. Difficulties encountered in making the transition from a linear to a porous battlefield were far more complex than was usually admitted, and the new units and doctrine could only have been employed on a conventional battlefield with difficulty. Many of these ideas probably appeared before their proper time, but additionally the Army did not have the weapons and equipment essential for proper application of the new doctrine. This appears to be a case where technology lagged behind doctrine, and strategic concepts raced ahead of tactical realities.

6. THE REORGANIZATION OBJECTIVE ARMY DIVISIONS CONCEPT

In 1959, the Army undertook a study to develop the operational and organizational concepts for the Army in the field during the time 1965-70. The basic premise was that the Army had the capability of conducting operations throughout the world in either a nuclear or nonnuclear environment and against a variety of enemy forces. Conventional firepower of the units had to be upgraded over that of the pentomic division, and tactical mobility and maneuverability had to be enhanced by armor-protected vehicles and aircraft.

The Reorganization Objective Army Divisions (ROAD) 1965 study was approved quickly in 1961, and President Kennedy announced his approval of the reorganization of the Army's divisions that would commence in early 1962. ROAD provided the basis for the resurrection of a powerful

conventional force capability and for the shift of emphasis from nuclear to nonnuclear warfare. The basic feature of the new ROAD division was a common division base to which a varying number of basic combat maneuver battalions could be attached. The ROAD mechanized infantry division was the first such organization in American military history. Aviation assets doubled over those found in the pentomic divisions. For the first time, the division had a support command.

Under the ROAD concept, Army forces were designed to operate in either a nuclear or a nonnuclear environment with emphasis placed on transition from nonnuclear to nuclear warfare. Previous doctrine had placed greater emphasis on the nuclear battlefield. Pentomic units, by contrast, were designed to make a transition from nuclear to nonnuclear conditions.

Much of the tactical doctrine for the ROAD division was similar to that existing before the pentomic revolution, and perhaps the most remarkable feature of the new doctrine was the return to the methods of the past. Methods for conducting offensive operations were not significantly different from those envisioned in the 1954 Field Service Regulations, with the exception of greater emphasis on vertical envelopments, especially by helicopters. Changes also occurred in the conduct of the defense, for the fundamental types of defense became the mobile and the area defenses. The terminology change from the "position" to the "area" defense signaled the need for defense in depth, as well as emphasizing that key terrain did not necessarily have to be occupied since enemy nuclear weapons might easily eliminate defense on such obvious positions. There was also a subtle increase in emphasis placed on destroying or ejecting the enemy from the defender's position.

There were other changes in terminology. The area where the main defensive effort would take place was called the main battle area before the Korean war, the forward defensive area after that war, the battle area in the pentomic concept, and, once again, the forward defensive area under the ROAD concept. The "reconnaissance and security line," a term which had endured from the late 1940s through the 1950s now became the "general outpost" and "combat outpost" lines. The term "main line of resistance" completely disappeared, and the term "forward edge of the battle area (FEBA)," was retained from the pentomic concept. While the changes may seem minor, each was designed to emphasize the greater dispersion and mobility of the ROAD units.

The infantry was the combat arms branch most affected by the new ROAD concept, which included increases in mobility and mechanization of the infantry. Formation of mechanized units forced the infantry to adopt many of the practices and thinking of the armor. Tactical doctrine, nevertheless, stressed continuity rather than change.

Prescribed frontages or densities for ROAD units differed greatly from those of the past. The changes can be seen most clearly in the conduct of the defense. During and immediately after World War II, the standard infantry division of approximately 13,207 men was expected to defend a front of about 7,000 meters, and a defense along a broad front was defined as a distance of about 15,000 meters. In the Korean war, an infantry division consisted of about 17,629 men and usually defended a front of about 21,000 meters. While this front was considered extremely broad, there were not enough ground units to reduce it significantly. Fortunately, the difficult Korean terrain strengthened the defenses of the thinly stretched troop line. With the pentomic division of about 12,191 men, the "normal" front was about 24,000 meters. This was considered acceptable because of the need for greater dispersion and depth on the atomic battlefield.

When the ROAD mechanized infantry division was created, it usually had about 13,512 men and was expected to defend along a front of about 20,000 meters. Interestingly enough, two ROAD mechanized infantry battalions were expected to defend a front almost equal to that of the World War II division.

Following the Korean war experience with defenses on broad fronts, the US Army focused on the defense of Europe, and ground commanders became accustomed to thinking of broader fronts because of the shortage of NATO forces. Increases in mobility and mechanization of the infantry also supported the extension of fronts. Similarly, with improved weapons, in terms of range and effect, the area controlled by an infantry unit was greatly expanded.

Subtle but important change also occurred in the American perception of the purpose of the defense. Whereas previous doctrine had focused on the retention of terrain, the ROAD concept placed greater emphasis on the destruction of enemy forces.

Ironically, the doctrinal changes inherent in the ROAD concept did not result in a greater emphasis on the offense even though ROAD units possessed a greater capability for offensive action than did pentomic units. While many tactical methods remained very similar to those of World War II, the postwar emphasis on the offense had dissipated.

Important alterations had also occurred in the Army's perceptions of concentration and dispersion. During the decade between the early 1950s and the early 1960s, the Army's thinking had changed as a result of its experiences during the Korean war, the greater emphasis on the defense in Western Europe, the long-term focus on attrition rather than maneuver, and the habitual tendency to assume that tactical nuclear weapons would be available to employ against massed, attacking enemy forces. While these changes were based on technological advances, they were also the result of increasing confidence in the power of the defense.

7. COUNTERINSURGENCY

Throughout the 1950s, a basic theme of Army policy was the need to be prepared to operate anywhere along the spectrum of conflict--from a show of force to general nuclear war. Although "limited" war (meaning less than total) was discussed in detail, especially in the late 1950s, counterinsurgency doctrine suffered from neglect and misunderstanding throughout most of that decade. As the Army became more and more concerned with nuclear warfare in the late 1950s, its interest in counterinsurgency and unconventional warfare waned. By the beginning of the 1960s, the US Army was not prepared in doctrine or equipment for conducting counterinsurgency operations.

Interest in counterinsurgency increased tremendously after President John F. Kennedy's election. It further increased when Nikita Khrushchev proclaimed in January 1961 that the Communists should avoid world and limited wars, but that "wars of liberation" were necessary and inevitable.

Perhaps the most difficult obstacle facing the Army as it attempted to prepare for counterinsurgency operations was the mental redirection and reeducation required of its officers and soldiers, most of whom had only been exposed to nuclear or conventional tactical doctrine. Attempts to redirect thinking were hampered by the absence of any clear doctrine. The conceptual problem was made even more complex by the simultaneous adoption of the ROAD organization and the wholehearted movement into counterinsurgency.

Considering the enormous scope of the problem, the Army responded rapidly, and numerous doctrinal publications soon appeared. The dominant theme of many of the initial publications on special warfare was the need for offensive operations stating that a defensive attitude permits the guerrilla to concentrate superior forces, inflict severe casualties, and lower morale.

Between 1953 and 1965, the Army had suffered through a number of dramatic changes in its tactical doctrine. These abrupt shifts in the focus of its doctrine forced the Army to reconsider every aspect of its tactics, organization, and equipment. Considering the sweeping nature of the changes, the ability of the Army to respond to counterinsurgency needs was remarkable. When the decade of doctrinal chaos ended, the Army entered one of the most difficult and complex wars in its history.

8. THE VIETNAM WAR

Although the United States contended that counterinsurgency operations should be combated through a combination of military operations and social reform, the demands of tactical operations in the Vietnam war remained the most important concern of the US Army. The focus on combat action was

especially true from the middle of 1966 when US forces launched their first prolonged offensive through late 1968 when "Vietnamization" of the war began in earnest. South Vietnamese units assumed an ever-increasing responsibility for military operations from late 1968 until the last US ground troops withdrew in August 1972.

Because of strategic and political considerations, the ground strategy remained that of a gigantic mobile defense. Tactical operations within the mobile defense were predominantly offensive, for the essential idea was to find and destroy the enemy. The war was characterized by its nonlinear and multidirectional nature. Improved communications, greater flexibility in command and control, increased American mobility, and the nature of the enemy insured that tactical operations in South Vietnam often bore little resemblance to those of the past. Despite a number of division- or multi-division-sized operations in the initial phases of American involvement to destroy large Viet Cong (VC) and North Vietnamese Army (NVA) units, tactical operations by brigades, battalions, and companies made up the bulk of the Army's effort throughout the war.

Employment of the helicopter enabled the free world forces to mass men and equipment in a fashion fundamentally affecting tactical methods. The dominant characteristic of the development of infantry organizations and tactics during the war was the increasing application of airmobile concepts and tactics. Helicopters could transport units to a battle area and could also enable them to maneuver or to reinforce, displace, or withdraw combat power during the battle.

Enemy units rarely accepted battle in unfavorable situations and only accepted decisive contact under exceptional circumstances. Their operations were usually ruled by the maxim: When the enemy advances, withdraw; when he defends, harass; when he is tired, attack; when he withdraws, pursue. The enemy's tactics attempted to compensate for his relatively weak firepower. He used a variety of tactics including ambush, harassment, and rapid strikes against Allied weak points, and minutely planned mass assaults. Regardless of the method used, the enemy normally sought to inflict casualties and then escape. VC and NVA units used several other techniques to weaken the effects of the Allied firepower to include night fighting, extensive networks of field fortifications, and "hugging" or engaging Allied units at very close distances. These techniques limited Allied use of artillery, airstrikes, and helicopter support. The enemy's willingness to accept heavy casualties and his ability to strike without warning forced the free world forces to approach every movement and action as if it were a combat operation.

The function of ground forces became the "finding" and "fixing" of the enemy, but the "fighting" and "finishing" were most often accomplished by massive artillery and air firepower. Because ground units were widely scattered, artillery units also had to be dispersed, and this resulted in

single batteries occupying separate fire support bases. The emphasis on operating from and defending these bases, however, led to what General Westmoreland described as a "fire base psychosis." American commanders were reluctant to operate beyond the support of their artillery and to risk fighting on near equal terms with VC or NVA units. While this excessive caution detracted from the maneuver and offensive capabilities of US units, it minimized American casualties. Offensive and defensive fire support also included armed helicopters, aerial rocket artillery, US Air Force tactical air support, and naval gunfire.

In short, firepower became the dominant characteristic of American operations. Maneuver was used primarily for locating and fixing the threat. Analyses of Army doctrine used during the Vietnam war concluded that the tactical doctrine was "generally sound" even though "expansion and emphasis" were required to take advantage of the Vietnam experience. US forces fought in South Vietnam from March 1965 until August 1972, a period of 7 years 5 months. During that time, the enemy suffered many losses, and the Allies won many victories. Those victories, however, did not prevent South Vietnam's defeat, and the unbridled use of firepower often detracted from the pacification program. The root of the failure probably resides more in the realm of strategy than in tactics.

The Vietnam war greatly affected the US Army. US troops fought very well through the first 3 or 4 years. In the latter phase of the war, the Army's performance changed. Fundamental problems appeared in leadership, morale, and training. Tactical thinking was also greatly influenced by the long war in Southeast Asia. For almost a decade, the Army's attention remained riveted on the infantry-intensive war in Vietnam, and the Army became accustomed to small-unit operations and to enjoying a massive superiority over the enemy on the battlefield. Emphasis on firepower and enemy attrition reached new heights in this war.

9. THE RETURN TO CONVENTIONAL OPERATIONS

Ironically, the great effort to redirect thinking in the early 1960s into counterinsurgency was now repeated as the Army focused on conventional operations. By late 1972, the environment was favorable for fundamental changes in US Army tactical doctrine. The major thrust of these changes revolved around the shift of the Army's focus from South Vietnam to Europe.

After examining potential areas of conflict, the Army's leadership concluded that the United States might face two types of wars: a mechanized war in Western Europe or a light infantry war in another part of the world. Although a mechanized war in Western Europe seemed the "least likely" of the two potential types of war, it represented the greatest threat to the national security and might involve the United States' "strongest and most dangerous enemy." The Army needed a period of hard work and retraining in which some of the problems of the Vietnam experience could be left behind.

In that sense, the Middle East war of October 1973 was an opportune occurrence. The combatants in that war came from relatively sophisticated and technical societies, employing modern weaponry in a midintensity environment. The startling violence and consuming nature of that war served to accelerate the transition from the previous focus on counterinsurgency to the new focus on conventional warfare.

The "lessons" of the 1973 Middle East war were reinforced by the common belief that as General William E. DePuy explained, "Because of the cost of and preoccupation with the Vietnam war, the Army lost a generation of modernization." During the period from 1965 to 1972, substantial forces had remained in Western Europe, but no major changes had been made in weapons, equipment, or doctrine. In contrast, the USSR had substantially modernized and strengthened its forces while the United States was involved in Southeast Asia.

With the appearance of a battlefield of unparalleled lethality and violence, with the absolute necessity to employ all advanced weapons of the complex combined arms team, with the crucial requirement for readiness and with the possibility of fighting outnumbered or at a disadvantage, the US Army faced what it considered to be a completely new situation.

FM 100-5, Operations, July 1976, analyzed these factors and concluded, "This circumstance is unprecedented * * *." The manual added, "Today the US Army must, above all else, prepare to win the first battle of the next war." The threat of a come-as-you-are war modifies many of the previous assumptions on which tactical doctrine has rested. The Army has been historically unprepared for its first battle. The threat posed by a numerically superior enemy employing blitzkrieg-type tactics makes the chances of winning subsequent battles slim at best if the first battle is lost.

These circumstances increase the need for a clear, coherent, and rigorous doctrine that can contribute to the combat efficiency and power of US forces by insuring that each weapon system is employed in the best possible fashion. The short war concept has been criticized by some, but it is clearly a rejection of the old mobilization concept that the United States has time to mobilize and train forces to go into combat. The doctrine does not rule out a series of battles, but it places its greatest emphasis on the first of those battles.

The 1976 doctrine also envisioned a different approach to the problem of nuclear warfare. In the late 1950s, there had been a fixation on the nuclear battlefield, and the changes in the early 1960s had envisioned a clear dichotomy between nuclear and conventional operations. In contrast, the 1976 doctrine rested on the implicit assumption that a war might begin with a conventional battle, move into a combined conventional-nuclear phase of uncertain length and, finally, return to a conventional battle. In sharp

contrast to the generally held view of the late 1950s and the 1960s that nuclear weapons would invariably be used (especially in Europe), Army commanders were instructed to plan on fighting without nuclear weapons. Although tactical nuclear weapons had previously been considered essential for halting a mass enemy attack, the 1976 FM 100-5 briefly discussed the employment of nuclear weapons against second-echelon or reserve forces. The manual stated: "Tactical advantage may be gained by neutralizing lead elements in the second echelon and by eliminating the enemy committed echelon's support and supporting fire systems. This can defeat his tactic of echelonment by destroying the followup reserves for the breakthrough, and by weakening enemy support. This will reduce pressure on friendly units in contact so they can contain engaged forces by conventional means and control the battle." Thus, nuclear warfare was treated as ancillary to the major concern: the conventional battle against the enemy's first-echelon forces.

In preparing the 1976 version of FM 100-5, the Army recognized that much had changed since the early 1960s when the doctrine for the ROAD division had been established. The changes have been primarily technological and included (among others): the introduction of accurate, long-range antitank weapons; the development of greater ranges for artillery by the use of rocket-assisted projectiles and large calibers; the introduction and improvement of the helicopter; the increased coverage and range of air defense weapons; the increased number and availability of automatic weapons; and the development of more accurate and lethal tank weapons.

Despite these numerous technological advances, doctrine for tanks, armored cavalry, and mechanized infantry had changed little during the past decade, and that doctrine had essentially been derived from World War II. It had been modified in the late 1950s and early 1960s.

When FM 100-5 was published in July 1976, it became one of the most controversial field manuals ever published by the US Army. The discussion of the defense in FM 100-5 has been the most debated aspect of the tactical doctrine. When the manual writers considered the defense in the early 1970s, they were convinced that the previously accepted mobile and area defenses were not completely applicable to the more lethal, modern battlefield. They were also convinced that the commanders often employed the two defenses without adequately analyzing whether they were appropriate for the situation faced at that time. Hence, the 1976 manual avoided a name for the new defense and stressed the following five fundamentals:

1. Understand the enemy.
2. See the battlefield.
3. Concentrate at the critical times and places.

4. Fight as a combined arms team.
5. Exploit the advantages of the defender.

In its list of purposes of the defense, FM 100-5 added a purpose that had not heretofore been included in such lists. The new purpose was to "force the enemy to mass so that he is more vulnerable to our firepower." The concept suggested in this purpose of the defense provides the foundation for the new methods, which subsequently came to be called the active defense. (See "How to Fight" manuals published after 1976 in app 8, such as FM 71-1, FM 71-2, FM 71-100, and FM 71-101.)

Some criticisms against the 1976 edition of FM 100-5 were that it overemphasized technology and attrition, resulting in deemphasis on maneuver; that it overemphasized the defense to the detriment of offensive spirit; and that the strategic emphasis on the European theater is unrealistic in light of current world problems and events. On balance, it serves us well to know that among the original aims of the manual were the intentions to redirect the thinking of the officer corps from counterinsurgency in Vietnam forward toward the threat posed by a technically advanced, modernized Warsaw Pact military system in Europe, to spur the research and development community, to preclude the Army from the old pitfall of training for the last war, and to encourage constructive debate on the best tactics and techniques to "fight outnumbered and win." Viewing the criticisms in this light, FM 100-5, Operations, has been very successful. The Army's knowledge of the threat is better than at any time in the past 35 years, active defense doctrine has been debated and refined over time within the Army, Air Force, Department of Defense, various "think tanks," the US Congress, and the Nation. The research and development community has been very productive. And the officer corps has been productively concerned with making combined arms operations of today and tomorrow work instead of arguing about the past.

10. 1982 AND BEYOND

Major doctrinal changes have come to pass with the printing of FM 100-5, Operations, August 1982. But the changes are still evolutionary instead of revolutionary because a synthesis has evolved that recognizes a balance between firepower and maneuver; the value of offensive action to achieve decisive results in battle, to include within the defense; the reality of enemy capabilities to employ tactical nuclear and chemical weapons; and the need for the Army to be able to operate on an integrated battlefield where any combination of conventional, nuclear, or chemical weapons may be used at any time.

The Army's force modernization program for the future--Army 86, is the first thoroughgoing reorganization of its field forces in nearly 20 years. It is recognized that, in a world of instantaneous communications, exposed political nerve ends, and unpredictable public sensation (where crises can

burgeon rapidly and leave little warning time before military action must be considered), the Army must have a flexible tactical doctrine and the capability to make optimum use of weapons and equipment based on the latest technology. The Army of Excellence organization and equipment changes and the new FM 100-5 are designed to provide the Army with this capability.

Nevertheless, doctrine cannot perform the impossible; it cannot provide final answers. Given the infinite variety of situations on the battlefield due to changing METT-T, the application of doctrine requires judgment. While doctrine is important for providing models for adaptation, the prime factors remain the American soldier's imagination, inventive genius, and will to fight.

Those who write doctrine cannot conceive of every possible situation, and those who fight cannot be expected to remember every possible answer. In that sense, too many doctrinal changes or too much doctrine can weaken the soldier's understanding and reliance on doctrine. When that happens, doctrine no longer accomplishes its most important purpose.

SELF-EVALUATION QUIZ

Can you discuss these issues? Are you satisfied with your answers?

1. What is the most important purpose of doctrine?
2. Why is it important to review the "doctrinal base" for a military subject, such as defensive tactics, or the employment of components of the combined arms team, etc, before attempting to write an operation order or teach a class?
3. When does doctrine become dogma? Should it ever become dogma?
4. Do you know where to find doctrine?
5. How familiar are you with threat doctrine? (Remember threat forces are very familiar with our doctrine.)
6. How would you compare the doctrine in the 1982 version of FM 100-5 with that espoused in the 1976 version? How are the two manuals different? How are they similar?

CORPS OPERATIONS

Lesson 1. Introduction to Corps Operations

Appendix 1 to Advance Sheet, Lesson 1/3, P315. General Situation

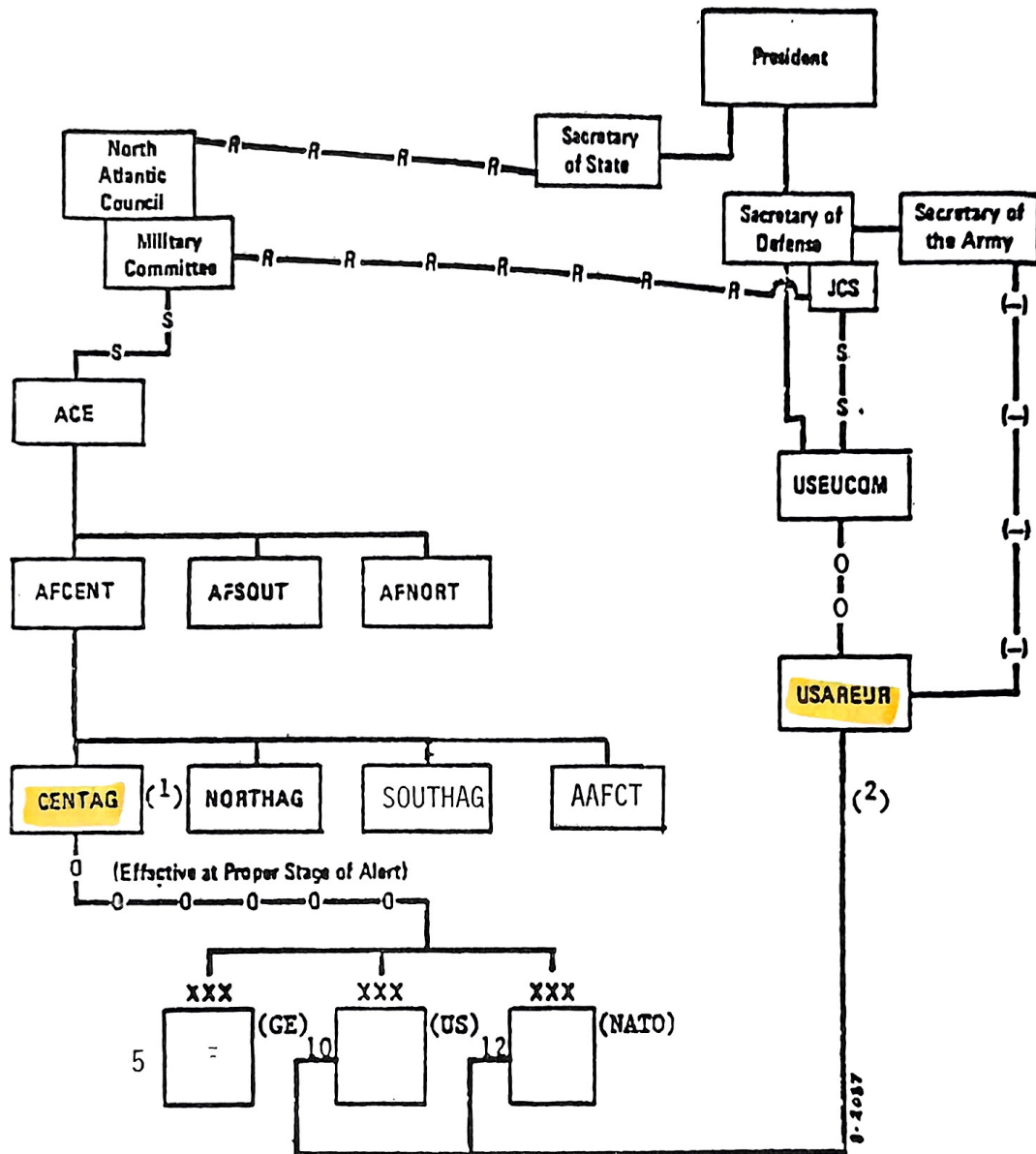
1. STRATEGIC ENVIRONMENT

a. Following World War II, Europe was divided by the Allies. In accordance with agreements drawn up during the war, all land captured by an Allied nation would be retained by that nation until the area could once again rule itself. At the war's end, Germany was split; the United States, Great Britain, and France had captured the western portion and the Soviet Union, the eastern portion. The capital of prewar Germany, Berlin, was located in the Soviet Union's area but was jointly occupied by the four powers. After 3 years of occupation, the Western Allies merged their zones and held elections to permit Germans to rule their own country. The Soviet Union refused to participate in the merger and the elections, stating that the people in the eastern portion were not ready for self-rule. From that decision derived the split nation--The Federal Republic of Germany (GE) in the west and the German Democratic Republic (GDR) in the east. Sovereignty over Berlin was divided. Half of the city was allied with the Federal Republic of Germany and the other half with the German Democratic Republic.

b. As the years passed, the rift between the Western Allies and the Soviet Union became wider. Each side created economic and mutual defense treaties. The Western Allies formed the North Atlantic Treaty Organization (NATO) with the stated purpose of maintaining peace through security and defense preparedness. The Soviet Union and its allies interpreted the presence of NATO as a threat to their existence; therefore, they entered into a mutual defense organization called the Warsaw Pact.

2. NATO COMMAND RELATIONSHIPS

a. During peacetime, the 10th (US) Corps and 12th (NATO) Corps are under US command authority (fig 1). The chain of operational command is to the US Army, Europe (USAREUR), to the US European Command (USEUCOM), and to the Secretary of Defense with strategic and operational direction provided to USEUCOM by the Joint Chiefs of Staff (JCS). At a predesignated stage of alert, the corps are placed under the operational command of Central Army Group (CENTAG) and are then operationally responsible to the NATO chain of command. CENTAG, along with Northern Army Group (NORTHAG), and Southern Army Group (SOUTHAG), is directed by the major subordinate NATO Command--Allied Forces, Central Theater (AFCENT)--which is under the command of Allied Command Europe (ACE), commanded by a NATO commander with the title of Supreme Allied Commander Europe (SACEUR).



LEGEND

- Command.
- (-)—— Command less operational command.
- O—— Operational command.
- S—— Strategic and operational direction.
- R—— Representation.

¹CENTAG organization as shown is for instructional purposes only.

²USAREUR command of corps changes to command less operational command when CENTAG assumes operational command.

Figure 1. Organization of Allied Command, Europe, and US Army forces.

b. Forces under national command during peacetime and under NATO operational command at the appropriate alert stage are said to be "earmarked" forces. ACE has some forces assigned under operational command during peacetime. Examples of US forces assigned to NATO are the air defense (such as US Hawk units) and Quick Reaction Alert units. Additionally, there are some forces that remain under national command during wartime: German Territorial Forces and US theater army commands; i.e., TAACOM, MEDCOM, PERSCOM, ENCOM, and TRANSCOM.

3. COMPARISON OF FORCES

a. NATO and Warsaw Pact.

	<u>NATO</u>	<u>Warsaw Pact</u>
Combat and direct support troops	1.2 million	1.7 million
Tanks	10,300	26,300
Tactical aircraft	2,350	4,075
Nuclear weapons	7,000	3,500

b. Friendly forces (CENTAG and 4th (Allied) Tactical Air Force (4ATAF)).

(1) CENTAG. CENTAG's sector is depicted in figure 2. CENTAG forces are at 103-percent strength, and all TOE equipment has been issued, with some coming from float stocks. No major equipment shortages exist. There are no significant maintenance problems. Troops have been undergoing intensive combat training.

(2) Fourth (Allied) Tactical Air Force (4ATAF). Elements of 4ATAF will support CENTAG. Estimates indicate that the enemy will initially have general air superiority over the battlefield; however, friendly air forces will be able to achieve local air superiority for limited periods. Commander, Allied Air Forces, Central Theater (COMAAFT) will issue the apportionment of air assets to CENTAG/4ATAF every 24 hours based on the tactical situation within the Central Theater. COM4ATAF will then (in accordance with COMCENTAG's guidance) issue the distribution of offensive air support to each corps.

c. Threat forces (land and air).

(1) The threat opposing CENTAG includes the 2 Western Front and the Central Front. The 2 Western Front (fig 2) is composed of two combined arms armies (CAAs), one guards tank army (GTA), one tactical air army (TAA), one airborne rifle division, one artillery division, one heavy artillery brigade, and one air assault brigade. The Central Front has a similar organization.

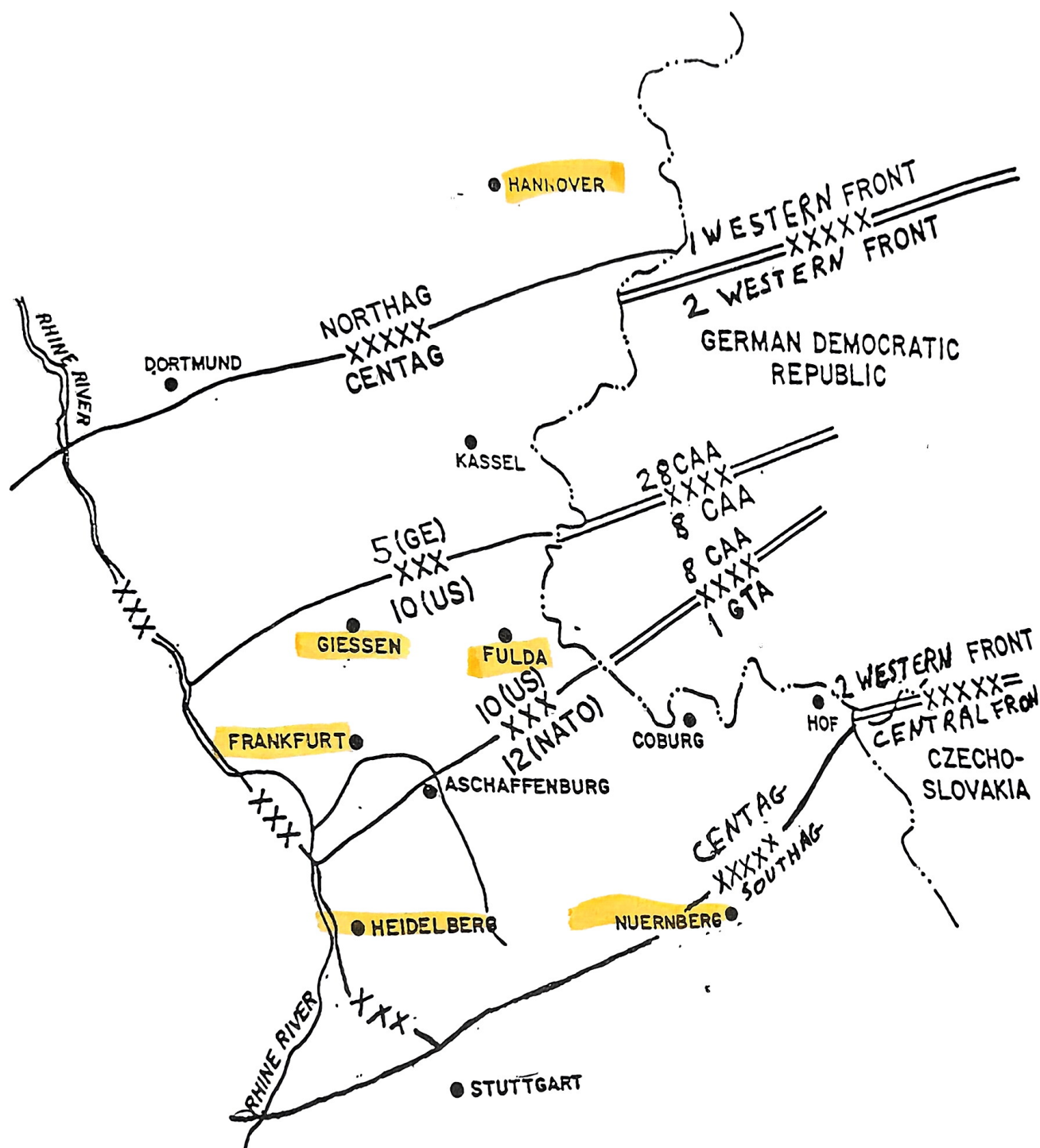


Figure 2. Sketch of CENTAG sector.

(2) When the 2 Western Front attacks the 10th (US) Corps, the first operational echelon force is expected to be the 8 CAA, consisting of three motorized rifle divisions (MRD), two tank divisions (TD), and one independent tank regiment. If the front commits its second operational echelon force in the 10th (US) Corps sector, it is expected to be the 1 GTA, composed of three guards tank divisions (GTD) and two MRD. Therefore, 10th (US) Corps could be attacked by a total of ten Warsaw Pact divisions (five MRD and five TD) and one independent tank regiment.

(3) When the 2 Western Front attacks the 5th (GE) Corps, the first-echelon force is expected to be the 28 CAA, consisting of four motorized rifle divisions (MRD) and one TD. As in the case of the 10th (US) Corps, the 5th (GE) Corps could also be faced by the 2 Western Front's second-echelon tank army (1 GTA) if it is committed in the 5th (GE) Corps sector. The 28 CAA has the option to attack the 12th (NATO) Corps.

(4) When the Warsaw Pact attacks 12th (NATO) Corps, the first-echelon force from the 2d Western Front is expected to be either the 28 CAA or the 1 GTA.

(5) The 2 Western Front has the 103 Guards Abn Rfl Div in reserve.

(6) The 26 TAA is organic to the 2 Western Front and provides tactical air support.

(7) The Soviet forces, not presently deployed with the 1 Western, 2 Western, or Central Fronts, include the Northern Front in Poland and a group of tank armies in the Western Military District in the USSR. The group of tank armies is the major Soviet strategic reserve that could be committed against the Central Theater.

(8) In summary, CENTAG expects the 2 Western Front to focus its main attack in the 10th (US) Corps sector between the Spessart and Knollgebirge Mountain chains. This main attack will be joined by supporting attacks in the 5th (GE) Corps and northern 12th (NATO) Corps sectors. However, the 2 Western Front could commit its second-echelon army behind either of the supporting attacks should the 10th (US) Corps defense prove to be formidable.

CORPS OPERATIONS

Lesson 1. Introduction to Corps Operations

Appendix 2 to Advance Sheet, Lesson 1/3. NATO Definitions and Procedures for the Employment of Offensive Air Support (OAS)

1. GENERAL

Attacking the enemy's uncommitted forces and resources is a major element of AirLand Battle doctrine. The purpose of this appendix is to describe the current concept for US Air Force support of land forces and to contrast differences in procedures to effect that concept.

2. US UNILATERAL DOCTRINE AND PROCEDURES

a. US unilateral doctrine to attack uncommitted forces and resources with interdiction assets is being developed under the title Joint Attack of Second Echelon (JSAK). Key elements of JSAK procedures include a battle coordination element (BCE) provided to the Air Force Tactical Air Control Center (TACC) normally by the senior land force headquarters.

b. Air interdiction (AI) operations are conducted in general support of surface forces. Battlefield air interdiction (BAI) is that portion of AI used to attack targets that have a near term effect on the scheme of maneuver of friendly ground forces. The amount of tactical airpower apportioned to AI may be subapportioned between BAI and theater air interdiction (TAI). NOTE: TAI is not an approved doctrinal term. We use it here to clarify the description of that portion of AI which is not BAI. The subapportionment decision is made either by the joint force commander or is mutually agreed upon by the air component commander and land component commander. Separate target lists are maintained for BAI and TAI. The BAI target list is prioritized by the land component commander through the BCE. All of AI, including BAI, is jointly planned in the TACC/BCE, generally on a preplanned basis.

c. Under JSAK, theaters modify tactical air control system (TACS) procedures based on theater specific requirements.

3. NATO PROCEDURES

a. The NATO concept for JSAK, called Follow On Forces Attack (FOFA), parallels the US unilateral doctrine. When we go to the Central Theater in Europe, the problem is of a much greater magnitude than that in smaller theaters/contingency operations. The land force may be over one million soldiers supported by 2,000 aircraft. The electronic warfare environment is such that BAI may not be manageable on a timely basis as a preplanned asset. Therefore, BAI is managed as a timeflow asset targeted by the

Corps/Air Force Support Operations Center (ASOC). Due to the multinational nature of the problem, NATO definitions and procedures apply.

b. There are two strategic and operational headquarters above the Army Group and Allied Tactical Air Force level, the Central Theater headquarters and Supreme Allied Headquarters Europe (SHAPE). SHAPE will manage a deep air interdiction (AI) campaign while the Central Theater headquarters will manage an intermediate range AI effort.

c. When we get down to the Army Group or CENTAG level, our situation is different than that faced by a corps or field army executing a contingency mission. In the NATO situation, there is no TACC in the air organization and BAI is called a subset of offensive air support (OAS) as opposed to a subset of AI. Air defense functions of a TACC are performed by the Sector Operations Center (SOC) of the Regional Air Defense Command, and the offensive air operations functions are performed in Allied Tactical Operations Centers (ATOCs). 4ATAF has two ATOCs. Each one manages air operations for a geographic portion of the Army Group sector. An Air Force Air Support Operations Center (ASOC) is established in each corps headquarters. (See figure 3.) A reconnaissance and interdiction planning line (RIPL) is drawn on the operations map to delineate the area forward of the corps fire support coordination line (FSCL) into an area for the corps to target BAI missions short of the RIPL and an area for the Army Group/Allied Tactical Air Force to target AI missions beyond the RIPL.

Detailed definitions and tactical air system control procedures for our 10th (US) Corps subordinated to CENTAG are contained here.

Forward Deployed Corps submit requests
for air —
Contingency Corps (committed singularly)
own all the JTF's air
throughout its AO —

AAFCT ORGANIZATION STRUCTURE

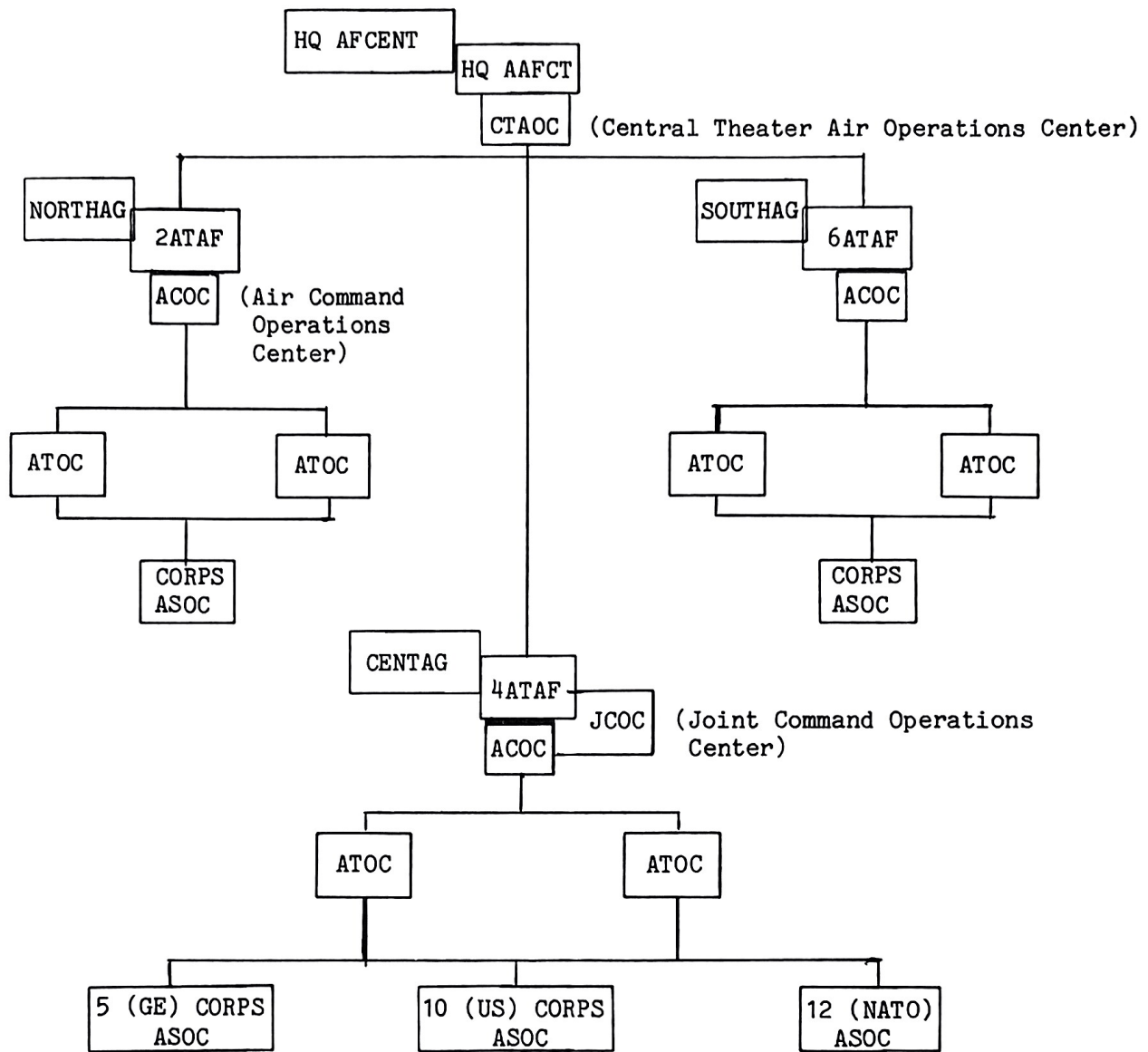


Figure 3.

FORWARD DEPLOYED CORPS

APPORTIONMENT AND ALLOCATION OF OFFENSIVE AIR SUPPORT

4. GENERAL

The following are NATO procedures. The NATO Tactical Air Working Party (TAWP) under the Military Agency for Standardization, Air Board, has defined offensive air support (OAS) operations as follows:

Offensive air support, as defined in Allied Tactical Publication (ATP) 27(B), Offensive Air Support Operations doctrine, is that part of tactical air support of land operations that consists of tactical air reconnaissance, battlefield air interdiction, and close air support, which are conducted in direct support of land operations. These OAS tasks are defined as follows:

a. Tactical air reconnaissance (TAR). Tactical air reconnaissance is air action to acquire intelligence information employing visual observation and/or sensors in air vehicles. (ATP 33(A)/ATP 27(B))

b. Battlefield air interdiction (BAI). BAI is air action against hostile surface targets that are in a position to directly affect friendly forces, but which are not yet directly engaged, and that requires joint planning and coordination. While BAI missions require coordination in joint planning, they may not require continuous coordination during the execution stage. (ATP 33(A)/ATP 27(B))

c. Close air support (CAS). CAS is air action against hostile targets that are in close proximity to friendly forces and that requires detailed integration of each air mission with the fire and movement of those forces. (ATP 33(A)/ATP 27(B)) This means that aircraft are under positive or procedural control at all times.

5. BACKGROUND ON APPORTIONMENT AND ALLOCATION PROCESS. (See Figure 4.)

It is essential that the apportionment and allocation of tactical air assets be accomplished at the highest appropriate level to insure the inherent flexibility of airpower is maintained.

The apportionment and allocation process is designed to assure optimum distribution of limited assets that must perform a wide range of missions. These assets can be tasked to perform counterair, air interdiction, and offensive air support as dictated by the tactical situation.

Apportionment is the determination and assignment of the total expected effort by percentage and/or priority that should be devoted to the various air operations and/or geographic areas for a given period of time (ATP 33(A)). Apportionment must be accomplished at the highest command level. (In the Central Region, this is the Allied Forces, Central Europe

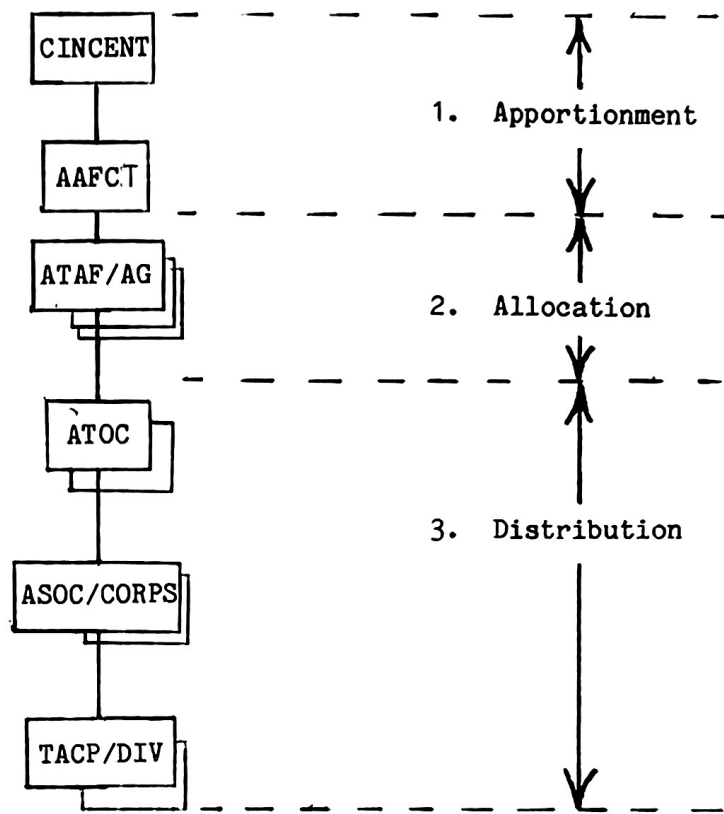


Figure 4.

(AFCENT)--Allied Air Forces, Central Theater (AAFCT)). This determination is based upon priorities established during consultations among subordinate commanders and the theater commander. The strategy, objectives, and priorities of the latter will be a primary factor in the apportionment decision.

Allocation is the translation of the apportionment into total numbers of sorties by the type of aircraft available for each operation and/or task (ATP 33(A)). It is accomplished at the level of command where the proper Army and Air Force interface occurs. In the Central Theater, this is at the Allied Tactical Air Force (ATAF)/Army Group level.

Factors that should be considered before determining apportionment, allotment of resources, and tasking the units are-- (Ref ATP 33(A)).

- a. The objective to be achieved.
- b. The nature and intensity of the conflict, tactical and strategic objectives, the strategy being employed and, in particular, the threat, the types of probable targets, and the likely response times required.
- c. The operational capabilities, limitations, and security of each type of weapon system, the terrain, and weather conditions.
- d. The availability of logistic support.
- e. The political restraints in effect.

When requesting air support, the land force commander will state his requirements for OAS in terms of specific targets and target arrays that will affect his operations, the degree of threat to his operations, and his target priorities. This allows OAS to be viewed as an entity that provides direct support to the land force commander, rather than as the separate contributions of the three parts of OAS (ATP 27(B)).

6. DISCUSSION ON BATTLEFIELD AIR INTERDICTION AND CLOSE AIR SUPPORT

The basic difference between CAS and BAI lies in the proximity of targets to friendly forces and the control arrangements that are therefore needed. Both CAS and BAI are tasked in support of the land commander against targets directly threatening land operations. Close air support missions require detailed control to integrate them with the fire and/or movement of friendly forces and must therefore be responsive to direction by the land force at all stages of execution. On the other hand, BAI missions once requested by the land commander are conducted entirely under Air Force direction, though fire coordination arrangements are necessary if the targets are short of the fire support coordination line (FSCL) (ATP 27(B)).

7. PLANNING AND COORDINATION

Of the major tactical air functions, offensive air support presents particular planning and coordination problems because OAS is employed in direct support of surface forces. With the introduction of battlefield air interdiction into OAS, the appropriate command level for planning and coordination must be codified.

While CAS is normally distributed down to division level and integrated into the ground commander's fire and movement plan, BAI is managed at either the Army Group/Allied Air Force or Corps/Air Support Operation Center (ASOC) level. CENTAG and 4ATAF established specific procedures to employ BAI at the corps/ASOC level. Figure 5 shows how OAS is managed for a US corps assigned to CENTAG. 4ATAF uses a computer-based electronic mail system for command and control of air operations.

For a particular day of battle, 4ATAF converts the higher headquarters apportionment decision to a specific number of OAS sorties that can be flown in 4-hour timeframes. COMCENTAG specifies which corps are to receive the available air support and the resulting 4ATAF allocation is converted to specific taskings to support each corps in the air tasking order published by the Allied Tactical Operations Center.

Under CENTAG and 4ATAF procedures, the corps commander or his representative make the BAI targeting decision based on near real-time intelligence forwarded as target nominations from the target intelligence branch in the Corps All-Source Intelligence Center (ASIC). The target decision cell personnel in the corps headquarters are collocated with the operations shift of the ASOC to insure that the aircraft available have the capability to strike the target and are provided current corps intelligence on threat air defenses which can affect the mission. The electronic mail capability of the computer-based communications systems used by both the Army corps and the Air Force command and control elements allow execution of BAI missions on a 3-hour tasking cycle.

BAI normally is not allocated below corps level because the divisions presently do not have the near real-time surveillance capability to perform the targeting function. CAS is normally allocated down to division and can be employed down to battalion level. Any level of command from battalion up can request TAR.

OAS REQUEST/ALLOCATION/TASKING CYCLE

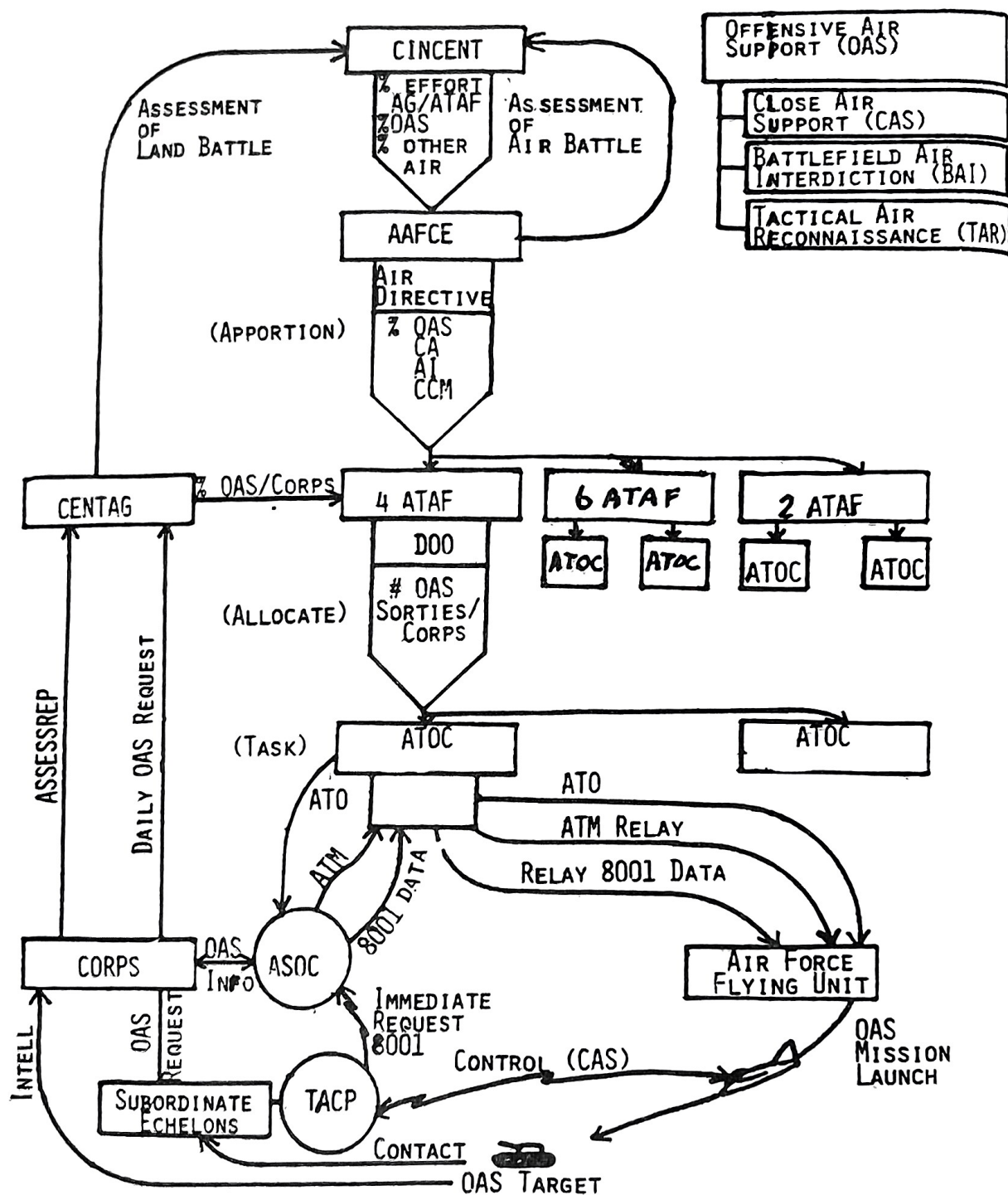


Figure 5. Request/Allocation/Tasking Cycle.

8. COMMAND RELATIONS

Using the Central Theater as a model, the following command relationships should apply:

a. AAFCT has overall operational command of Allied air forces and--

- (1) Determines priorities in relation to CINCENT's objectives.
- (2) Apportions attack and reconnaissance forces to the 2ATAF, 4ATAF, and the 6ATAF for the conduct of mutually supporting OAS operations.
- (3) Apportions critical air resources such as electronic warfare and defense suppression units in support of OAS.

b. ATAFs have operational control of assigned and allotted resources and--

- (1) Coordinates priorities with Army groups.
- (2) Jointly analyze Army Group requests to determine the OAS effort.
- (3) In coordination with the Army Group, divide the OAS effort into preplanned and immediate sorties available for OAS operations.
- (4) Designate weapon systems for employment in OAS.
- (5) Allocate aircraft and delegate the related tactical planning for CAS to the appropriate ATOC.
- (6) Perform tactical planning for BAI.
- (7) Allocate aircraft to the appropriate ATOC for execution of BAI.

c. ATOCs have tactical control of allocated forces and--

- (1) Conduct tactical planning in coordination with the ASOCs involved to include selection of weapon systems and units, mission composition, time over targets (TOT), and ordnance selection as well as details on tactical control arrangements.
- (2) Dispatch air tasking order (ATO) to flying units and all concerned agencies.
- (3) Direct execution of immediate offensive air support missions to flying units and coordinate details with concerned agencies.

d. ASOCs:

(1) Jointly plan and pass corps requests for OAS sorties to the ATOC.

(2) Pass corps requests for additional CAS sorties to the ATAF through the ATOC for those mission requests that cannot be supported within the corps' current distribution.

(3) Request immediate support to the ATOC.

(4) Pass all necessary details concerning tactical control and targeting information to the pertinent ATOC.

(5) Manage final CAS mission execution through assignment of tactical air control party (TACP) and forward air controller (FAC).

NOTE: ASOCs also conduct detailed tasking and direct execution of OAS missions when authorized by the appropriate ATOC.

9. PLANNING

The basic concept of planning for OAS is continuous dialogue and coordination between appropriate land and air headquarters echelons. Although there is no fixed sequence of events, the general planning flow is outlined below:

a. Based on CINCENT's priorities and objectives, COMAAFT will issue resource employment and execution directives to the ATAFs. These directives will establish priorities for conventional attack resources by function; i.e., offensive air support, counterair and air interdiction, or by specific task. Following this, the Army Groups will present the ATAF commanders with their percentage allocation of assets to each corps, based on their operational plans. The ATAF commander will apply his allocated resources against this percentage guidance and inform the Army Group commander of his ability to meet the OAS requirement in time blocks.

b. The attack resources within the allocation for OAS will be used in either close air support or battlefield air interdiction. This decision is made at the ATAF/Army Group level. Normally, close air support will only be employed when army organic firepower cannot cope with a threat.

c. After the ATAF commanders have decided on the basic allocation of their forces to support the ground forces, all related planning should be on a joint basis in order to insure coordination of joint air/ground matters as well as integration of air and ground plans.

d. The Army will have up-to-date intelligence on the frontline tactical ground situation and will be continuously assessing the threat and assigning priorities to targets as well as reacting to changing tactical situations. Generally, sufficient information will be available only at corps level to determine whether it is possible to engage and counter a threat with conventional organic firepower or whether it is necessary to have this organic firepower supplemented by OAS.

e. The Army Groups will obtain the OAS effort available from their respective ATAF offensive operations staff for the period. Based on the current tactical situation and their forecast plans, the Army Groups will establish priorities for the distribution of OAS resources. An air allocation message will be forwarded from each Army Group to their appropriate corps HQ as well as to the allied tactical operations centers.

f. The ASOC has direct contact with army fire support agencies and is responsible for insuring that CAS and BAI are employed effectively and economically. The land force commander, at corps level and below, should consult with his Air Force representative (ASOC commander, air liaison officers (ALO), or FAC as appropriate) on all matters concerning OAS. Corps and ASOCs will keep their Army Group and ATAF continuously informed on their planning activities. This will insure required coordination and "deconfliction" with all other air activity in the area and facilitates weaponeering, force sizing, and coordination of support activities such as electronic warfare, suppression of enemy air defenses, escort, etc.

10. REQUESTING OAS

Requests for OAS may be initiated at any level of command. Air liaison officers and FACs are assigned to army command echelons and they advise and assist in the transmission of requests for OAS. Normally, fire support by air units should not be requested for targets that can be engaged by organic army firepower unless the added firepower will produce decisive results or the tactical situation is such that organic army firepower must be supplemented by airpower.

CORPS OPERATIONS

Lesson 1. Introduction to Corps Operations

Appendix 3 to Advance Sheet, Lesson 1/3. Threat Order of Battle

Western Theater of Military Operations (TVD) (against AFCENT)

1st Western Front, Western TVD (against NORTHAG)

2 Combined Arms Army (CAA)

21 Motorized Rifle Division (MRD)

94 Guards Motorized Rifle Division (GMRD)

207 MRD

8 MRD (East German Army) (EGA)

16 Tank Division (TD)

3 Shock Army

12 Guards Tank Division (GTD)

47 GTD

10 GTD

25 TD

20 CAA

6 GMRD

14 GMRD

35 MRD

1 MRD (EGA)

9 TD (EGA)

16 Air Army

3 Airborne Division

20 Air Assault Brigade

21 Hv Arty Bde

71 Indep Tank Regt (ITR)

14 SSM Bde (SCUD-B) (EGA)

9 SSM Bde (SS-23)

5 SSM Bde (SS-22)

4 SAM Bde (SA-4)

1 SAM Bde (SA-4) (EGA)

34 Arty Div

27 SP Gun Bde (96 M1981 2S5)

24 Gun Regt (72 M-46)

19 SP How Bde (96 2S3)

35 SP How Bde (72 2S3)

12 AT Bde (48 125mm AT Gun/26 BRDM-2) w/AT-3/4)

36 MRL Bde (72 BM-27)

U/I Diversionary Bde (probably consisting of a Soviet reserve
abn regt and the 5 & 40 E Ger Para Bns)

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2d Western Front, Western TVD (against CENTAG)

8 CAA (against 10th (US) Corps)

39 GMRD

120 GMRD

9 GTD

79 TD

4 MRD (EGA)

13 ITR

110 Arty Regt (72 M-46/18 D-20)

30 MRL Regt (BM-21)

3 SSM Bde (SCUD-B)

4 Attack Helicopter Regt (40 Hind E/20 Hip C)

19 SAM Bde (SA-4)

U/I Spetsnaz Co

28 CAA

27 GMRD

11 MRD (EGA)

20 GMRD

7 GTD

50 GMRD

1 Guards Tank Army (GTA)

57 GMRD

22 MRD

11 GTD

3 GTD

7 TD (EGA)

36 SSM Bde (SCUD-B)

42 SAM Bde (SA-4)

2 Atk Hel Regt

U/I Spetsnaz Co

103 Guards Airborne Div

26 Air Army

8 Ftr Div

6 Ftr-Bmbr Div

23 Ftr-Intcp Div

10 Recon Regt

15 Trans Hel Regt

21 Hel ECM Sqdn

76 General Purpose Hel Sqdn

21 Air Assault Brigade

1 Heavy Artillery Brigade (24 B-4M/24 M-240)

48 SSM Bde (SCUD-B) (E. Ger)

67 SSM Bde (SCUD-B)

19 SSM Bde (SS-12)

10 Artillery Division

14 G/H Regt (54 D-20)

17 G/H Regt (54 D-20)

21 Gun Regt (54 M-46)

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- 29 Gun Regt (54 M-46)
- 41 AT Regt (36 T-12/27 BRDM 2 w/AT-3/4)
- 37 MRL Bde (22 BM-27)
- 60 SAM Bde (SA-4) (EG)
- 66 SAM Bde (SA-4)
- U/I Diversionary Bde
- 10 Radio Intercept Regt
- 52 Radio Jamming Regt
- 53 Air Defense Jamming Regt
- 14 Radio & Radar Intercept Regt

Central Front, Western TVD (Against SOUTHAG)

- 41 CAA
 - 18 GMRD
 - 2 MRD (Czechoslovakian) (CZ)
 - 3 MRD (Cz)
 - 5 MRD (CZ)
 - 1 TD (CZ)
- 8 GTA
 - 31 TD
 - 51 TD
 - 9 TD (CZ)
 - 13 TD (CZ)
- 12 CAA
 - 66 MRD
 - 55 MRD
 - 4 TD (CZ)
 - 19 MRD (CZ)
 - 20 MRD (CZ)
- 14 TD (C) Front Reserve
- 1 Air Army (2 Soviet fighter-interceptor regts and 1 Soviet recon regt
(approximately 150 acft total) reinf by CZ air Force (approx 470 acft))
- 25 SSM Bde (SCUD-B)
- 69 SSM Bde (SCUD-B)
- 27 SSM Bde (SS-12)
- 54 Arty Div
 - 61 Gun Regt (54 M-46)
 - 50 Gun Regt (54 M-46)
 - 46 G/H Regt (54 D-20)
 - 63 G/H Regt (54 D-20)
 - 72 AT Regt (36 T-12/27 BRDM-2 w/AT-3/4)
 - 45 MRL Bde (72 BM-21)
- 57 SAM Bde (SA-4)
- 26 SAM Bde (SA-4)
- U/I Diversionary Bde (probably consisting of the 7 Czech
bn Regt)

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Northern Front, Western TVD (TVD 2d Operational Echelon)

- 4 CAA (Polish) (PL)
 - 8 MRD
 - 12 MRD
 - 15 MRD
 - 1 MRD
 - 16 TD
- 4 GTA
 - 20 TD
 - 20 TD (PL)
 - 10 TD (PL)
 - 11 TD (PL)
- 24 CAA
 - 2 MRD (PL)
 - 3 MRD (PL)
 - 4 MRD (PL)
 - 9 MRD (PL)
 - 38 TD
- 6 Airborne Div (PL)
- 5 TD (PL) (Front Reserve)
- 24 Air Army
- 7 Amphibious Assault Bde (PL)
- 70 SSM Bde (SCUD-B)
- 17 SSM Bde (SCUD-B)
- 24 SSM Bde (SS-12)
- 1 Arty Div
 - 80 Gun Regt (54 M-46)
 - 32 Gun Regt (54 M-46)
 - 12 G/H Regt (54 D-20)
 - 15 G/H Regt (54 D-20)
 - 20 AT Regt (36 T-12/27 BRDM-2 w/AT-3/4)
 - 13 MRL Bde (72 BM-21)
- 8 SAM Bde (SA-4)
- 33 SAM Bde (SA-4)
- U/I Diversionary Bde (probably consisting of elements of the 6 Polish Abn Div)

Groups of Tank Armies (TVD Strategic Reserve)

- 7 GTA
 - w/4 Soviet TDs
- 5 GTA
 - w/4 Soviet TDs

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CORPS OPERATIONS

Lesson 2. Corps Execution of First CENTAG Operation

Advance Sheet, Lesson 2

SCOPE

This 36½-hour lesson focuses on planning and executing the 10th (US) Corps General Defense Plan IAW the AirLand Battle doctrine and the CENTAG Campaign Outline. Upon receipt of the corps mission from CENTAG, you will complete the intelligence, operations, and logistics estimates; give a decision briefing; and write portions of 10th (US) Corps OPLAN 1. Having completed OPLAN 1, you will be given an updated war fighting situation and apply the military decisionmaking process to develop corps-level FRAGOs to eliminate an airborne division in the corps rear area, execute a corps counterattack, and execute a deep attack against a threat tank division to give other corps forces time to execute the counterattack. You will plan the reconstitution of the 208th ACR after the covering force battle. This lesson has 12 sublessons.

TERMINAL LEARNING OBJECTIVES*

- E. TASK: Prepare operations estimates for a forward deployed corps.
- F. TASK: Develop intelligence estimates for a forward deployed corps and utilize intelligence products in support of the decisionmaking process.
- G. TASK: Complete a corps logistics estimate.
- H. TASK: Present decision briefings for the forward deployed corps operation plans.
- I. TASK: Prepare selected portions of a corps OPLAN or OPORD in order to communicate the commander's decision for a forward deployed corps operation plan.
- J. Develop corps FRAGOs.
- K. TASK: Develop a personnel and material reconstitution plan for a corps unit.
- L. Describe nondivisional fire support at corps level.
- M. TASK: Synchronize the execution of the corps AirLand Battle.

*The conditions and standards for these ELOs are printed on the P315 Advance Sheet. The applicable TLOs and ELOs are found on the advance sheets for the sublessons.

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OUTLINE

<u>Lesson No.</u>	<u>Title</u>	<u>Proponent</u>	<u>Hours</u>
2/1	The Soviet Rear Area Threat	DTAC	2
2/2	Mission Analysis and Commander's Guidance	DTAC	1
2/3	Intelligence Estimate	DCOM	3
2/4	Tactical Air Reconnaissance	USAF	1
2/5	Operations Estimate--Develop COAs	DTAC/USAF	3½
2/6	C2 Considerations	DCOM	2
2/7	Ops Estimate, Analyze COAs, and Review Log Estimate	DTAC/DCS	5
2/8	Decision Briefing	DTAC/DCOM/ DCS/USAF/	2
2/9	C2 System Planning Factors	DCOM	2
2/10	Write and Brief OPLAN	DTAC/DCOM DCS/USAF	1
2/11	Execution of 10th Corps General Defense Plan	DTAC/DCOM	9
	Exam	DTAC	2
2/12	Reconstitution of 208th ACR	DCS	3
		TOTAL	36½ Hours

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CORPS OPERATIONS

Lesson 2. Corps Execution of First CENTAG Operations

Appendix 1 to Advance Sheet, Lesson 2. European Scenario

The scenario is designed for CGSC instructional use only as an illustrative example of how the AirLand Battle doctrine might be executed at the Army group and theater level. It does not reflect NATO doctrine or policy.

The CGSC European Scenario was designed to teach military operations applying the AirLand Battle doctrine. The NATO alliance was formed to deter war. This scenario deals with a situation where deterrence has failed and the Warsaw Pact has attacked with the intent to seize Western Europe.

The intent of this scenario is to emphasize the notions of preconceived maneuver, the indirect approach, and the concentration of power at a decisive time at the operational level of war. CINCENT, the commander in chief of Allied Forces Central Theater (AFCENT), is the combined force commander who dictates the operational concept for the Central Theater of Western Europe. He visualized a Warsaw Pact main effort in the Northern Army Group (NORTHAG) sector and intends to defeat these forces with a turning movement on or about D+20 initiated by a heavy corps attack out of the Central Army Group (CENTAG) sector.

The threat force projected against the central region is the Western Theater of Military Operations (Western TVD), which is organized into four fronts and a group of tank armies. The Western TVD has 67 motorized rifle or tank divisions and 3 airborne divisions organized into 14 tank or combined arms armies supported by 4 air armies.

The AFCENT sector and template of first-echelon fronts is shown on map A with corps boundaries for the CENTAG sector. CINCENT has six uncommitted US POMCUS divisions that will be available for combat by D+10. CINCENT expressed his intent and probable commitment of the POMCUS divisions to the Army group commanders in the following AFCENT campaign outline:

AFCENT Operational Intent--Defeat the Western TVD with a turning movement, restore NATO territory, and avoid threatening the survival of the USSR.

1st Operation (4-7 days)

NORTHAG--Absorb main effort and successfully defend forward of the Hamburg, Hannover line. (Two POMCUS divisions available D+2.)

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CENTAG--Defend in sector to absorb secondary effort and execute feasible local attacks to secure portions of the Thuringer Wald.

SOUTHAG--Absorb secondary effort, defend well forward.

2d Operation (7 days)

NORTHAG--Defend in sector, execute feasible local attacks and build up reserves.

CENTAG--Defend in sector, if feasible attack to open Hof Corridor and secure Leipzig; if feasible open Eisenach Corridor and secure Eisenach. (Two POMCUS divisions available D+6, two POMCUS divisions available D+10.)

SOUTHAG--Defend well forward, secure CENTAG southern flank.

3d Operation (7 days)

NORTHAG--Contain Warsaw Pact forces in zone.

CENTAG--Attack in the direction of Berlin to cut the threat LOC and turn the force attacking NORTHAG; open MSR from Frankfurt to Leipzig.

SOUTHAG--Defend well forward, contain threat force attacking through Czechoslovakia and Austria.

4th Operation (7-14 days)

NORTHAG--Attack to defeat all forces in zone and restore NATO territory.

CENTAG--Isolate Berlin and sever threat LOC; detach 5th (GE) Corps to NORTHAG; prepare to defend along the Oder-Neisse River line against new forces arriving from the east.

SOUTHAG--Defend southern flank, attack to restore NATO territory where feasible.

As a result of the campaign outline developed by the AFCENT staff, the CENTAG staff developed their campaign outline. The Commander of Central Army Group (COMCENTAG) gave the following CENTAG Campaign Outline to his three corps commanders as initial planning guidance. COMCENTAG visualized that as the war developed after D-day, the day the threat invaded NATO territory, substantial West German territory could be lost. By D+10, two fronts would end up committed against NORTHAG, but there would be a 150 to

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250 kilometer gap between the committed forces and the group of tank armies that could transit Poland. From an operational point of view, CENTAG could defeat the two fronts attacking NORTHAG with a turning movement to sever the threat LOCs and secure good defensive terrain along the Oder-Neisse River System. This would deny the Soviet Union the opportunity to continue to commit fresh forces from the east and allow NATO forces the opportunity to restore their territory. He cautioned the corps commanders that, while the operational intent is firm, the corps designated to initiate the counteroffensive could change prior to execution of the third operation.

at Corps + Div:

G-2 should try to develop a targeting plan which will create a Time Distance Gap, if possible, - to allow an opportunity for offensive ops.

G-3 Should insure that G-2's acquisition plan supports CG's intent & concept.

G-3 Plans a key player now in the Follow-On Forces attack (FOFA) effort -

CENTAG CAMPAIGN OUTLINE

Intent: Turn the Warsaw Pact main effort against NORTHAG, permitting detailed destruction of 17 to 30 divisions by NORTHAG. Prevent threat penetration in Bavaria.

1st Operation (4-7 days)

5th (GE) Corps--Defend well forward in area of operations; if under light pressure, be prepared to attack to relieve pressure against NORTHAG. CFA coordination points: _____ to NB718485; MBA coordination points: _____ to NB535480.

10th (US) Corps (main effort)--Defend well forward to defeat enemy force in zone/attack to secure portions of the Thuringer Wald if conditions permit. CFA coordination points: NB718485 to NA880960; MBA coordination points: NB535480 to NA710845.

12th (NATO) Corps--Defend well forward; attack to secure portions of the Thuringer Wald and open Hof Corridor if conditions permit. CFA coordination points: NA880960 to _____; MBA coordination points: NA710845 to _____.

2d Operation (7 days)

5th (GE) Corps--Defend in sector; prepare to attack to the north.

10th (US) Corps (main effort)--Defeat a CAA; if feasible attack to secure Eisenach. (One POMCUS division D+6.)

12th (NATO) Corps--Defend in sector if feasible attack to open Hof Corridor/isolate Leipzig. (One POMCUS division D+6.)

3d Operation (7 days)

5th (GE) Corps--Secure area of operations; prepare to attack to the north (OPCON to NORTHAG).

10th (US) Corps--Turn clearing operations in West Germany over to the German Territorial Command, open and maintain MSR to Leipzig/pass two POMCUS divisions through Eisenach/Leipzig.

12th (NATO) Corps (main effort)--Detach western division and area of operations west of Bayreuth to 10th (US) Corps, receive two POMCUS divisions (D+10), and exploit to sever western TVD LOC's vicinity Berlin.

4th Operation (7-14 days)

5th (GE) Corps--Operation Command to NORTHAG.

10th (US) Corps--Begin clearing area of operation; keep 12th (NATO) Corps MSR open.

12th (NATO) Corps--Isolate Berlin, link up with Berlin NATO forces, cut all Warsaw Pact MSRs from Poland, and be prepared to defend against threat from the east along the Oder-Neisse River line.

Desired Conclusion: 17 to 30 Soviet, Polish, and East German divisions isolated and operationally defeated by NORTHAG, NATO forces occupying defensible terrain along the Oder-Neisse River line, threat from Czechoslovakia/Austria neutralized, and survival of the Soviet Union not threatened.

Result: A political settlement favorable to NATO.

CGSC resident instruction will focus on planning and war-fighting by the notional 10th (US) Corps during various phases of the CENTAG campaign outline. The first major student requirement will be the development of a 10th (US) Corps General Defense Plan to attain the objectives of the first operational phase of the CENTAG campaign outline. A solution-discussion to this requirement will provide the situation and mission for the first major requirement in P316, Division Operations. The second major student requirement in P315 will be planning the counteroffensive. The CGSC solution-discussion to this requirement will be 10th (US) Corps OPLAN 3 and operations overlay, which will be the background for the division deliberate attack problem in P316.

We have intentionally designed the 10th (US) Corps Troop List to facilitate teaching Army of Excellence transitional and final organizations and the type units that may be in the field during the 1986-87 time frame. The 23d Armd Div is organized based on the Army of Excellence transition TOEs with the exception of the cavalry squadron (H-Series). The 313th Sep Mech Bde is organized based on an H-series TOE. The Corps Aviation Brigade (J-Series TOE), has four AH-64 battalions and two AH-1S battalions.

The scenario is designed for CGSC instructional use only as an illustrative example of how the AirLand Battle doctrine might be executed at the Army group and theater level. It does not reflect NATO doctrine or policy.

CORPS OPERATIONS

Lesson 2. Corps Execution of First CENTAG Operation

Appendix 2 to Advance Sheet, Lesson 2. COM4ATAF's Concept of Operation

"COMCENTAG and I share a common objective, which is to prevail by winning the AirLand Battle within our common sector of responsibility. However, I believe that if we fail to win the initial air battle in the first couple of days, we will not be able to properly support the ground battle. Therefore, I fully expect that the CINCENT/COMAAFT initial apportionment of air assets will be heavily weighted to counterair operations. This does not mean that we will not support ground operations during the first couple of days; however, it does mean that all available tactical air assets that can fly counterair missions will do so. Those aircraft that have only an air-to-ground function (e.g., A-10, F-111, etc) will be flown in that mode. It also means that BAI assets may be severely limited during this initial counterair fight and that the corps may have to rely primarily on its air maneuver units for deep attack.

"Once we have bludgeoned the threat's initial air attack, I believe that we will be able to establish and maintain air parity with the threat air forces which will allow us to achieve local air superiority for limited periods when required. I expect this initial counterair battle to last for 2 or 3 days.

"While it is difficult to assess the exact threat to the CENTAG sector, I anticipate that the forces directly opposing the central theater will have approximately 4,000 combat aircraft, 1,000 of which are frontline aircraft. Many will be interceptor-type aircraft. I further expect that they will attack the central theater, beginning at first light, with 300 to 500 ground attack sorties against targets ranging to a depth of about 200 kilometers. The threat's target priorities will be: (1) air defense sites, (2) nuclear delivery means and storage sites, (3) command and control centers and facilities, (4) airbases and parked aircraft, and (5) depots and garrisons of field units not yet deployed. This attack should be completed within 2 to 3 hours. It will be protected by a 300 to 400 fighter cap and air defense suppression sorties. The threat will also keep a substantial number of aircraft on alert, protected by air defense artillery and located in hardened, aircraft shelters.

"After this initial attack, I expect the threat to concentrate many of his aircraft on counterair missions, continuing to harass our airfields and using numerous close air support (with attack helicopters) and interdiction sorties to maintain the momentum of his main and secondary ground attacks. Threat air will also be employed to conduct, protect, and support heliborne and airborne assault operations.

"The threat will probably not use fixed-wing aircraft for close air support near the international boundary, since he will have the advantage of forward-disposed and massed artillery to support his attack. In addition, I anticipate that he will use his attack helicopters to provide the majority of his initial close air support. Large numbers of air defense weapons will also be positioned near the international boundary to protect his attacking ground forces. However, as his forces push through the covering force area, they will outrange the more static elements of the boundary air defenses and will have to rely on mobile air defense systems, which will be displacing forward or will be fired from hasty, exposed positions.

"As to the amount of offensive air support we will provide to the corps, CINCENT/COMAAFT will issue our initial apportionment percentage for the CENTAG sector. Many considerations will affect this initial apportionment with the primary factor being the aforementioned demand for emphasis on counterair operations. Once the battle has been started, variations to the initial apportionment will be affected by the status of the land battle, air attacks against our airbases, our existing sortie rate, the success of our counterair and air defense suppression effort, the weather as it varies throughout our area of operations, and the number of aircraft directed for retention on nuclear alert. In any case, on receipt of this apportionment, I, in close coordination with COMCENTAG, will allocate the apportionment into numbers of sorties by aircraft type available for BAI, CAS, and TAR. CAS sorties can be distributed down to brigade level for planning purposes. These sorties will be primarily A-10s and Alpha Jets and will be reasonably available over time because we expect to be able to generate 5-10 sorties per day per aircraft. BAI and TAR involve more complex operations and will be distributed for planning and targeting no lower than corps level. The corps ASICs will have the best near real-time information on the area between the FSCL and the RIPL so the corps commander's designated staff section and the ASOC will jointly target and task the distributed BAI sorties.

Our biggest decision every 24 hours will be the specific allocation and distribution of BAI and TAR sorties into 4-hour time blocks. Due to the limited TAR assets, TAR will usually be controlled at the army group/ATAF joint command operations center level. BAI sorties are more flexible and more complex to manage. The aircraft that execute the BAI mission will primarily be F-4s, A-7s, and F-16s. These are multirole aircraft that will also be executing counterair and interdiction missions. Therefore, based on events in the overall air campaign, there will be time blocks when a lot of BAI will be available and others when the aircraft are committed to other missions. In addition, we will manage some of the available BAI in our Joint Command Operations Center against targets beyond the RIPL to support the multicorps battle while individual corps are targeting their BAI sorties in support of operations by their subordinate units. Some BAI missions will be two-sortie precision strikes against high-value-point targets while other missions may involve air task forces of 15 to 150 aircraft.

"One of our most difficult missions will be to assist the ground commanders in finding, targeting, and striking the second-echelon threat forces. Weather, communications jamming, and the intermingling of threat forces will complicate acquisitions; however, I do expect that the threat forces will be moving quite openly along the major routes. We will have to concentrate our strikes against chokepoints, major roads, and railways. XX

"Remember, the flexible and responsive combat power afforded by our air assets may make the difference in victory or defeat in the central theater. As a result, we must be very careful in our application of such valuable and limited assets."

Sir:

We stress/emphasize use (By G2/G3)
 of NATI'S & TAI'S —
 Named area of Interest
 Target Area of Interest

Ft. Huachuca publishes a super
 book (pamphlet) on IPR
 which articulates there —
 Col. D.

CORPS OPERATIONS

Lesson 2. Corps Execution of First CENTAG Operation

Appendix 3 to Advance Sheet, Lesson 2. 10th (US) Corps Troop List

COMBAT AND COMBAT SUPPORT ELEMENTS

<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
HHC, 10th (US) Corps	52-2H	379
52d Mech Div	JFT	16,893
23d Armd Div	JFT	16,591
313th Sep Mech Bde	37-100H	5,021
208th ACR	J.	3,458
1st Bn (Ranger), 780th Inf	7-85H	604
HHB, 68th FA Bde	6-401H	152
HHB, 69th FA Bde	6-401H	152
HHB, 70th FA Bde	6-401H	152
1st Bn (Lance), 206th FA	6-595H	465
1st Bn (Lance), 207th FA	6-595H	465
1st Bn (Lance), 208th FA	6-595H	465
2d Bn (MLRS), 675th FA	JFT	454
2d Bn (203, SP), 606th FA	6-445H	478
2d Bn (203, SP), 607th FA	6-445H	478
2d Bn (203, SP), 608th FA	6-445H	478
2d Bn (203, SP), 609th FA	6-445H	478
2d Bn (155, SP), 636th FA	6-455H	497
2d Bn (155, SP), 637th FA	6-455H	497
HHC, 10th ADA Bde	J	128
1st Bn (Gun/Stinger), 431st ADA	J	701
1st Bn (I Chap), 432d ADA	J	473
1st Bn (I Chap), 433d ADA (Div Spt)	J	750
1st Bn (Hawk, Triad), 451st ADA	44-265H	773
HHC, 10th Cbt Avn Bde	J	71
HHC, 102d Atk Avn Gp	J	51
HHC, 103d Atk Avn Gp	J	51
HHC, 104th Cbt Avn Gp	J	51
110th Atk Hel Bn (AH-1S)	J	261
111th Atk Hel Bn (AH-1S)	J	261
112th Atk Hel Bn (AH-64)	J	250
113th Atk Hel Bn (AH-64)	J	250
114th Atk Hel Bn (AH-64)	J	250
115th Atk Hel Bn (AH-64)	J	250

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<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
120th Combat Support Aviation Bn (CSAB) (UH-60)	J	350
121st CSAB (UH-60)	J	350
117th General Support Aviation Bn (GSAB) (OH-58)	J	467
120th Medium Helicopter Bn (MHB) (CH-47)	J	885
HHD, 20th MI Gp (CEWI)	34-102J	52
200th MI Bn (CEWI) (Aerial Xplt)	34-145J	400
210th MI Bn (CEWI) (Tac Xplt)	34-125J	571
220th MI Bn (CEWI) (Op)	34-105J	581
10th LRSC (Long-Range Surveillance Company)	J	124
41st Cml Co	3-87JFT	125
333d NBCE (Tm JA)	3-500H (JA)	5
334th NBCE (Tm JA)	3-500H (JA)	5
349th NBCE (Tm JB)	3-500H (JB)	10
350th NBCE (Tm FA)		
351st NBCE (Tm JB)	3-500H (JB)	10
371st NBC Recon Tm (Tm LA)	3-500H (LA)	4
52d Smoke Generator Co	3-67J	134
53d Smoke Generator Co	3-67J	134
HHC, 53d Engr Bde	5-101H	161
500th Engr Cbt Bn	5-35H	839
501st Engr Cbt Bn	5-35H	839
503d Engr Cbt Bn	5-35H	839
511th Engr Cbt Bn	5-35H	839
550th Engr Cbt Bn (Hv)	5-115H	788
HHC, 570th Engr Bn (Comp)		34
5001th Engr Topo Co	5-337H	147
5006th Engr Dptrk Co	5-124H	80
5045th Engr Aslt Fltbrg Co (Ribbon)	5-79H	184
5051st Engr Aslt Fltbrg Co (Ribbon)	5-79H	184
5070th Engr MAB Co	5-64H	206
5076th Engr Mdm Girder Brg Co	5-74H	106
5080th Engr Cbt Spt Equip Co	5-58H	249
5081st Engr Cbt Spt Equip Co	5-58H	249
5115th Engr ADM Co	5-57H	194
HHD, 20th MP Gp	19-272H	95
230th MP Bn	19-76H	586
231st MP Bn	19-76H	586
232d MP Bn	19-76H	586
385th MP Det (Crim Inves)	19-620H (8 GA)	4
386th MP Det (Crim Inves)	19-620H (8 GA)	4
387th MP Det (Crim Inves)	19-620H (8 GA)	4

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<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
HHC, 20th Sig Bde	11-402H	182
700th Sig Bn Co	11-405H	508
705th Area Sig Bn	11-415H (620)	873
706th Area Sig Bn	11-415H (620)	873
712th Sig Rdo Bn	11-425H	697
740th Area Sig Co	11-417H	175
		<u>68,046</u>

COMBAT SERVICE SUPPORT ELEMENTS

<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
10th COSCOM	54-22H (410)	311
2421st DPU (COSCOM)	29-550T	155
2005th MMC Co (COSCOM)	54-23H (510)	388
4104th Trans MCC (COSCOM)	55-6H	44
Hwy Reg Pt Tms (three four-man teams)	55-540H(GG)	12
789th Mov Con Tm	55-580H(LB)	5
790th Mov Con Tm	55-580H(LB)	5
791st Mov Con Tm	55-580H(LC)	7
797th Mov Con Tm (Air Tml)	55-580H(LF)	34
798th Mov Con Tm (Air Tml)	55-580H(LF)	34
13th Spt Gp	29-102H	92
14th Spt Gp	29-102H	92
530th EOD Con Cen Tm	9-520H(AA)	6
534th EOD Tm	9-520H(FA)	10
535th EOD Tm	9-520H (FA)	10
536th EOD Tm	9-520H (FA)	10
126th AVIM Bn	J	500
		<u>1,715</u>
HHD, 90th Maint Bn (GS)	29-136H	56
900th Maint Co (DS)	29-208H	274
908th Maint Co (DS)	20-207H	227
924th LE Maint Co (GS)	29-134H	198
930th Hv Equip Maint Co (GS)	29-137H	226
932d Hv Equip Maint Co (GS)	29-137H	226
932d Svc Co (Coll & Clas)	29-139H	199
		<u>1,406</u>
HHD, 91st Maint Bn (GS)	29-136H	56
909th Maint Co (DS)	29-207H	227
911th Maint Co (DS)	29-207H	227
925th LE Maint Co (GS)	29-134H	198
931st Hv Equip Maint Co (GS)	29-137H	226
933d Svc Co (Coll & Class)	29-139H	199
		<u>1,133</u>
HHD, 20th S&S Bn (GS)	29-146H	70
201st S&S Co (DS)	29-147H	181
202d S&S Co (DS)	29-147H	181
223d Fld Svc Co (GS) (Fwd)	29-114H	122
		<u>554</u>

<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
HHD, 21st S&S Bn (GS)	29-146H	70
203d S&S Co (DS)	29-147H	181
204th S&S Co (DS)	29-147H	181
206th S&S Co (DS)	29-147H	181
255th QM Adrp Sup Co	10-407H	278
		<u>891</u>
HHD, 22d S&S Bn (Prov)	29-146H	70
236th Hv Mat Sup Co (GS)	29-127H	183
238th Gen Sup Co (GS)	29-118H	210
248th Rep Parts Sup Co (GS) (Corps)	29-119H	255
253d Acft & Msl Rep Parts Sup Co (GS)	29-129H	170
		<u>888</u>
HHC, 51st Ammo Gp (DS/GS)	9-62H	78
HHC, 55th Ammo Bn (DS/GS)	9-66H	88
503d Ord Convl Amo Co (DS)	9-64H	214
504th Ord Convl Ammo Co (DS)	9-64H	214
505th Ord Convl Ammo Co (DS)	9-38H	295
507th Ord Convl Ammo Co (DS)	9-64H	214
511th Ord Sp Ammo Co (DS)	9-84H	218
519th GM Maint Co (GS)	9-59H	148
363d MP Security Co	19-97H	141
HHC, 56th Ammo Bn (DS/GS)	9-66H	88
500th Ord Convl Ammo Co (DS)	9-64H	214
501st Ord Convl Ammo Co (DS)	9-64H	214
502d Ord Convl Ammo Co (DS)	9-64H	214
506th Ord Convl Ammo (DS)	9-38H	295
520th GM Maint Co (GS)	9-59H	148
		<u>2,783</u>
HHD, 33d Petr1 Sup Bn	10-226H	54
257th Petr1 Sup Co	10-227H	191
279th Petr1 Sup & Op Team	10-560H(JB)	8
721st Trans Mdm Trk Co (Petr1)	55-18H	176
722d Trans Mdm Trk Co (Petr1)	55-18H	176
		<u>605</u>
HHD, 70th TMT Gp	55-12H	48
HHD, 771st TMT Bn	55-16H	49
709th Trans Mdm Trk Co (Cntnr/Cgo)	55-18H	186
734th Trans Lt-Mdm Trk Co	55-67H	195
735th Trans Lt-Mdm Trk Co	55-67H	186
753d Trans Tml Trf Co	55-118H	265
782d Tlr Trf Pt Op Tm	55-540H(GE)	16

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<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
HHD, 772d TMT Bn	55-16H	49
730th Trans Hv Trk Co (Cgo)	55-28H	150
710th Trans Mdm Trk Co (Cgo)	55-18H	186
733d Trans Lt-Mdm Trk Co	55-67H	195
754th Trans Tml Trf Co	55-118H	265
783d Tlr Trf Pt Op Tm	55-540H(GE)	16
		<u>1,806</u>
HHD, 55th CA Tac Spt Bn	41-206H	45
502d CA Tac Spt Co	41-207H	100
503d CA Tac Spt Co	41-207H	100
516th CA Rear Area Co	41-208H	95
		<u>340</u>
HHD, 82d Med Gp	8-122H	54
HHD, 800th Med Bn	8-126H	39
855th Med Amb Co	8-127H	107
856th Med Amb Co	8-127H	107
8118th Med Det (Air Amb)	8-660H(RA)	53
8119th Med Det (Air Amb)	8-660H(RA)	53
8120th Med Det (Air Amb)	8-660H(RA)	53
8121st Med Det (Air Amb)	8-660H(RA)	53
8889th Surgical Svc Tm	8-630H(KA)	7
8103d Neurosurgical Tm	8-630H(KE)	7
8152d Den Svc Det	8-670H(HA)	58
8153d Den Svc Det	8-670H(HA)	58
8800th--8814th Disp	8-620H(OA)	150
8162d Vet Svc Det	8-680H(JA)	6
7153d Vet Svc Det	8-680H(JA)	6
8886th Psychiatric Svc Tm	8-620H(OM)	48
809th MASH	8-123H	290
810th MASH	8-123H	290
845th MEDSOM unit (level 2)	8-287H	145

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<u>Unit</u>	<u>TOE</u>	<u>Strength</u>
811th CSH ¹	8-123H	290
812th CSH ¹	8-123H	290
834th Evac Hosp ¹	8-581H	385
835th Evac Hosp ¹	8-581H	385
836th Evac Hosp ¹	8-581H	385
837th Evac Hosp ¹	8-581H	385
857th Med Amb Co ¹	8-127H	107
865th Med Clr Co ¹	8-128H	140
866th Med Clr Co ¹	8-128H	140
871st Med Co (ACR) ¹	8-147H	124
		<u>4,215</u>
HHD, 10th P&A Bn	12-66H (220)	46
100th PSC (Type D)	12-67H	190
101th PSC (Type D)	12-67H	190
110th Fin Svc Org	14-500H(AD)	13
		<u>439</u>
	Total COSCOM	16,775

¹Dual-based units (REFORGER) are deployed by air from CONUS and are issued equipment from pre-positioned stocks maintained by the US Army Combat Equipment Group Europe.

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CORPS OPERATIONS

Lesson 2. Corps Execution of First CENTAG Operation

Appendix 4 to Advance Sheet, Lesson 2. 10th (US) Corps Time-Phased Forward Deployment List (TPFDL)

<u>Unit</u>	<u>Available</u>	<u>TOE</u>	<u>Strength</u>
2d Bn (203, SP), 614th FA	M+8	6-445H	478
2d Bn (155, SP), 638th FA	M+8	6-455H	497
2d Bn (155, SP), 639th FA	M+8	6-455H	497
2d Bn (155, SP), 640th FA	M+8	6-455H	497
			<u>1,969</u>
HHC, 61st Engr Gp	M+9	5-52H	118
54th Mech Div	M+11	JFT	16,893
25th Armd Div	M+11	JFT	<u>16,591</u>
			33,484
HHB, 66th FA Bde	M+12	6-401H	152
2d Bn (203, SP), 611th FA	M+12	6-445H	478
2d Bn (203, SP), 612th FA	M+12	6-445H	478
2d Bn (155, SP), 641st FA	M+12	6-455H	497
2d Bn (155, SP), 642d FA	M+12	6-455H	497
2d Bn (155, SP), 643d FA	M+12	6-455H	497
200th Psyop Bn	M+12		450
838th Evac Hosp	M+12	8-581H	<u>385</u>
			3,434
837th Evac Hosp	M+13	8-581H	385
850th Med Air Amb Co	M+14	8-137H	197
53d Mech Div	M+15	JFT	16,893
21st Inf Div	M+15	JF	<u>10,212</u>
			27,105
HHB, 67th FA Bde	M+16	6-401H	152
2d Bn (203, SP), 616th FA	M+16	6-445H	478
2d Bn (203, SP), 628th FA	M+16	6-445H	478
2d Bn (155, SP), 631st FA	M+16	6-455H	497
2d Bn (155, SP), 634th FA	M+16	6-455H	497
2d Bn (155, SP), 635th FA	M+16	6-455H	<u>497</u>
			2,599

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<u>Unit</u>	<u>Available</u>	<u>TOE</u>	<u>Strength</u>
HHC, 62d Engr Gp	M+17	5-52H	118
110th Repl Reg Org	M+17	12-560H (AD)	<u>7</u>
			125
502d Engr Cbt Bn	M+18	5-35H	769
509th Engr Cbt Bn	M+18	5-35H	<u>769</u>
			1,538
HHD, 571st Engr Bn (COMP)	M+19	5-500H	35
780th Tlr Trf Pl Op Tm	M+20	55-540H (GE)	16
258th Petr1 Spt Co	M+21	10-227H	191
722d TMT Co (Petr1)	M+21	55-18H	186
507th Ord Co Convl Ammo (DS/GS)	M+21	9-38H	<u>295</u>
			672
506th Ord Co Convl Ammo (GS)	M+22	9-38H	295
710th Trans Mdm Trk Co (Cgo)	M+23	55-18H	186
364th MP Scty Co	M+23	19-97H	<u>141</u>
			327
111th Repl Reg Org	M+24	12-560H (AD)	7
781st Tr1 Trf Pt Op Tm	M+24	55-540H (GE)	<u>16</u>
			23
2175th Spt Cen, Rear Area Op	M+26	JO	110
911th Maint Co (DS)	M+26	29-207H	227
701st Trans Acft Maint co (AVIM)	M+26	55-459H	<u>332</u>
			669
229th Fld Svc Co (GS) (Fwd)	M+28	29-114H	181
102d Petr1 Sup Co	M+31	10-227H	191
700th Trans Acft Maint Co (AVIM)	M+33	55-459H	332
901st Maint Co (Rear)	M+33	29-208H	227
103d Petr1 Sup Co	M+33	10-227H	<u>191</u>
			750
735th Trans Lt-Mdm Trk Co	M+34	55-67H	195
9908th Hv Equip Maint Co (GS)	M+35	29-137H	274

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<u>Unit</u>	<u>Available</u>	<u>TOE</u>	<u>Strength</u>
910th Maint Co (DS)	M+36	29-207H	227
730th Trans Hv Trk Co	M+36	55-28H	<u>153</u>
			380
205th S&S Co (DS)	M+37	29-147H	181
907th Hv Equip Maint Co (GS)	M+40	29-208H	274

CORPS OPERATIONS

Lesson 2. Corps Execution of First CENTAG Operation

Appendix 5 to Advance Sheet, Lesson 2. Description of the Area of Operations

1. GENERAL

The 10th (US) Corps area within CENTAG, bounded by the 5th (GE) Corps on the north and 12th (NATO) Corps on the south, contains several key terrain features. Major hill masses are the Knollgebirge, Vogelsberg, Hohe Rhon, Spessart, Thuringer Wald, and Taunus Mountain areas (fig 6). The Knollgebirge is in the north, the Vogelsberg in the center, and the Hohe Rhon and Spessart Mountains are to the south. The Taunus Mountains dominate the corps rear area. The major terrain feature forward of the 10th (US) Corps is the Thuringer Wald. The primary drainage systems are the Fulda, Werra, and Haune Rivers in the east; the Eder River in the north; the lower Main plain, which includes the Main, Kinzig, Nidda, and Nidder Rivers, in the southeast; and the Klein Sinn, which feeds into the Main to the south.

2. RELIEF

a. Cross-country movement for tracked vehicles in the German central highlands is generally poor to undesirable. Restricted movement in the area is caused by dominant rugged, hilly, and mountainous landforms. Some of the most important of these are the Taunus Mountains near the Rhine River and, farther to the east, the rugged hills of the Vogelsberg, the Hessian Hills, the Spessarts, and the Hohe Rhon surrounding Fulda. Even the few valleys that form limited natural corridors of movement in this region are dotted in many places with a dense pattern of built-up areas that would hinder the movement of armored vehicles. This is particularly true in the lower Main lowland.

b. Two-way tank traffic is possible along the autobahns and many of the main highways, except where these pass through cities and towns. Secondary roads are not wide enough for two tanks, but many will permit one-way traffic.

c. Major avenues entering or adjacent to the 10th (US) Corps are the Fulda Gap avenues, the Hessian Corridor, and the Meiningen Corridor. The Fulda Gap consists of two or three division-sized avenues north of Fulda City and a division avenue south of the city. The Fulda Gap is considered a dangerous approach because it provides the shortest route from the international boundary to the Rhine River. The Hessian Corridor is a major flank approach from the north, and it is a historic invasion corridor from

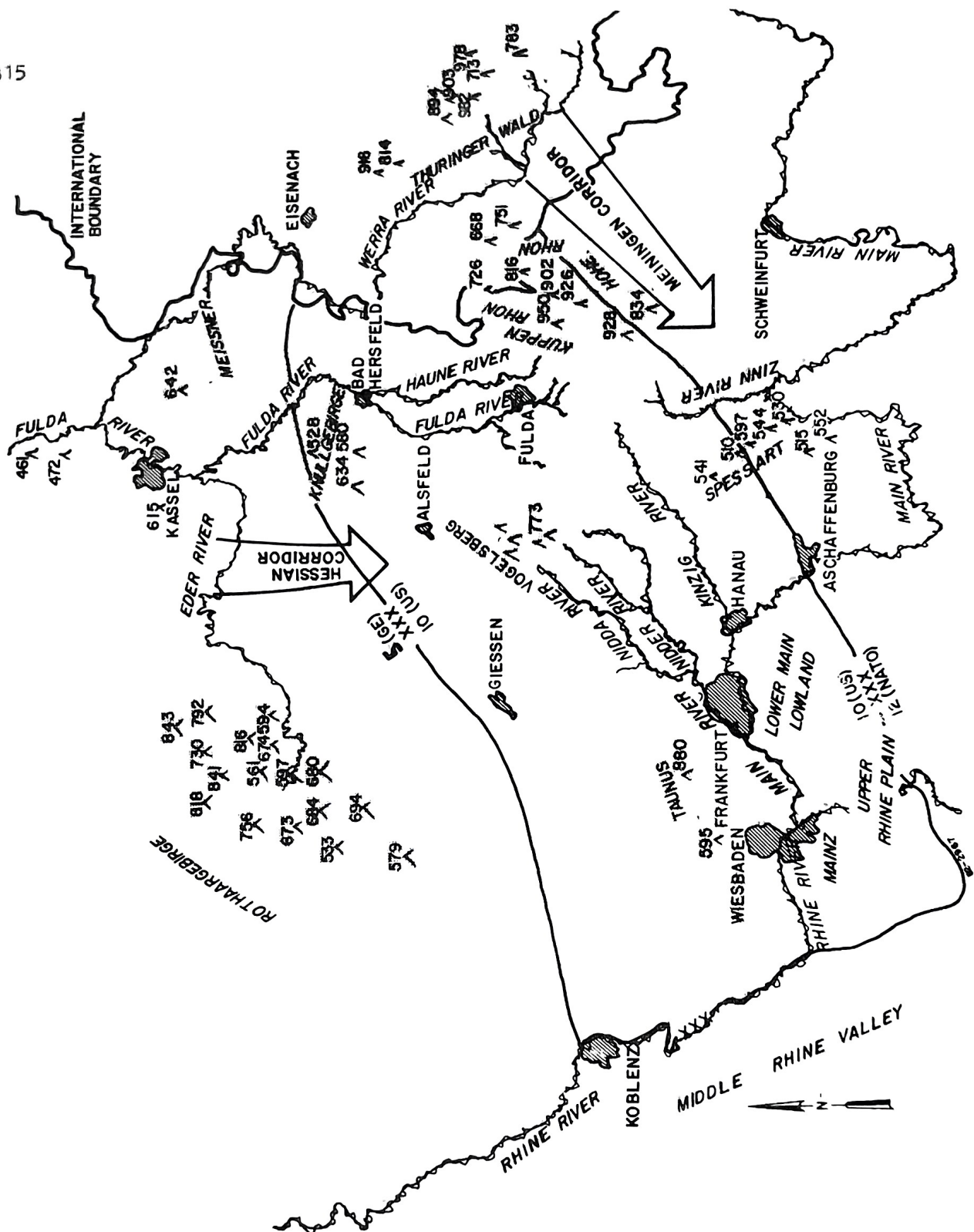


Figure 3. Sketch of 10th (US) Corps area.

east to west toward the Rhine River. It is a two-division-sized approach into the 10th (US) Corps sector. The Meiningen Corridor is a two-division-sized avenue of approach adjacent to the 10th (US) Corps southern boundary. It is considered to be a dangerous approach because of its excellent open maneuver space. Specific approaches in the Fulda Gap are described as follows:

(1) Avenue A--Starts at EISENACH (NB94) then proceeds to the town of OBERSUHL (NB74) at the international boundary then to LUDWIGSAU, crosses the FULDA River, continuing westerly through KNULLGIBERGE to the town of NB33, then to AMONENBURG (MB92) or turns southwest to the communications center of ALSFELD (NB12), joining avenues B and C. Then it continues westerly deep into the sector toward KOBLENZ.

(2) Avenue B--Starts at BAD SALZUNGEN (NB93), to VACHA (NB73) on the international boundary, crosses the HAUNE River and the FULDA River south of BAD HERSFELD and north of NIEDERJOSSA continuing westerly to the communications center at ALSFELD. West of ALSFELD, it merges with avenues A and C. This avenue continues west, passing north of the VOGELSBURG and can branch southwest to FRANKFURT and the TAUNUS, or continue through the GEISSEN/WETSLAR center to KOBLENZ.

(3) Avenue C--Starts at SCHMALKALDEN (PB02), to GEISA (NB61) on the international boundary, crosses the HAUNE and FULDA Rivers, south of the town of SCHLITZ (NB31) and north of the town of FULDA. Once past the FULDA River, the avenue can swing northwest up the valley to LAUTERBACH and ALSFELD, or continue west-southwest to Hill 554 (NA28) generally following route 275 to the TAUNUS Mountains (north of FRANKFURT). This avenue presents the potential to swing either north or south of the VOGELSBURG.

(4) Avenue D--Starts at WASUNGEN (NB91), to OBERWEID (NB70) on the international boundary, crosses the FULDA River and can merge with avenue C west of FULDA or continue south through the town of SCHLUCHTERN (NA37) continuing down the KINZIG River Valley to GELNHAUSEN and to FRANKFURT. The avenue can branch south of FRANKFURT, securing the crossing over of the MAIN and RHINE Rivers. Even though the KINZIG River Valley approach is somewhat restricted in maneuver space, it is the shortest and most direct route to FRANKFURT. The southern portion of this avenue includes portions of the HOHE RHON and the SPESSARTS.

(5) HESSIAN Corridor. Any major enemy force that penetrates to Autobahn E4 south of KASSEL in the 5th (GE) Corps sector develops a threat option to commit a division-sized operational maneuver group into the 10th (US) Corps rear through the Hessian Corridor.

d. Seasonal conditions alter the quality of cross-country movement, mainly by quantitative changes in soil moisture content. Weather conditions are most favorable for cross-country movement from midspring to late autumn

(mid-April through November). Heavy rains are apt to cause deep mud for periods of a few hours to a few days in areas of fine-grained soils. In winter and spring (December through March), long spells of precipitation produce persistent unfavorable trafficability conditions. In winter (from December through February), freezing rain and fog can create an intermittent hazard to movement on and off roads. Snow, however, does not form a thick or lasting cover in the trafficable areas. Silty soils may be frozen sufficiently deep and hard to sustain traffic. At high elevations, ice and deep snow can be hazards to road traffic.

e. Fog is apt to be a hindrance for as many as 7 days each month during autumn and early winter. It occurs most frequently in the valleys during autumn and on the hills during winter. Fog is usually a hindrance only in the morning hours, commonly dissipating by noon.

f. Cross-country movement conditions for individual terrain areas are as follows:

(1) Fulda Valley. The Fulda Valley generally is a hindrance to movement. The steep slopes of the valley combined with dense forests normally preclude offroad movement of tanks. The valley bottom, which rarely attains a width of 2 kilometers, is generally wet and unsuitable for movement except during part of the summer. The river is unfordable north of Bad Hersfeld but may be forded at selected sites south of this point.

(2) Fulda-Werra Hills. In both the Fulda-Werra Hills and the Rhon, offroad movement is limited to scattered smooth valleys and low hills, which generally are surrounded by forest-covered sandy ridges. Generally, these forested ridges are rugged and constitute obstacles to offroad movement of tanks, but in places they are smooth and can be crossed by using the numerous lanes that normally traverse forested areas. Along many of the streams are flood plains that are wet and untrafficable most of the time, except during part of the summer. Although most are narrow, the poorly drained flood plains along the Werra River attain a width of about 3 kilometers. The Werra is unfordable throughout its course in this sector.

(3) Hessian Hills. Movement is generally unimpeded. Local hindrances to movement include continuous tracts of poorly drained soils, road and railway embankments, and drainage lines with steep banks. The Eder River downstream from the Edersee generally is not fordable.

(4) Thuringer Wald. This major mountainous area forward of the 10th (US) and 12th (NATO) Corps sectors is a significant hindrance to rapid movement. This area is heavily forested with steep valleys and narrow winding roads. It contains numerous defiles and potential chokepoints.

(5) Hohe Rhon. Forested, rugged hills in most places make cross-country mobility generally unsuitable. Offroad movement is possible

on rolling hills, mainly in the center and northwest area of the Hohe Rhon, but it is difficult because of dense forest. Many small tracts in the center can be bypassed; large tracts in the northwest can be penetrated on forest lanes oriented mainly east to west.

(6) Kinzig Valley. This is a natural, east-west corridor of movement, but offroad movement is severely restricted by steep slopes; large, heavily forested areas; and a dense concentration of built-up areas. The river may be forded at selected locations.

(7) Knullgebirge. Movement is generally poor but is feasible in the valleys. Forested hills are a severe hindrance. Soils are seasonally muddy.

(8) Lower Main Lowland. This area is passable most of the time. Main hindrances are the unfordable Main River, forest, and areas of loose sand. This area is most apt to be unsuitable in late winter and early spring.

(9) Nidda River. This river is fordable at only selected locations.

(10) Spessarts. The eastern two-thirds is unsuitable for offroad movement, except locally, because of steep, forested slopes. In the west, offroad movement is possible, but local hindrances may cause delays; flood plains along streams are untrafficable except during summer; and scattered forests restrict direction of movement except along forest lanes.

(11) Taunus. Generally unsuitable in the steep, rugged, and forested hills toward the west. Offroad movement on rolling plains in the center and north is difficult because of large tracts of dense forest; lanes, oriented in northeast-southwest and northwest-southeast directions, permit limited forest penetration. Numerous narrow flood plains are wet and untrafficable except during summer.

(12) Upper Rhine Plain. The higher parts of the Upper Rhine Plain adjoining the hills to the east are passable at all times, except for short periods in spring. Closer to the stream, slow surface drainage and a seasonally high water table hinder movement most of the year. Some depressed parts of the plain are permanently impracticable for movement.

(13) Vogelsberg. Suitability of this area is limited; offroad movement is compartmentalized by tracts of dense forest; numerous lanes permit some forest penetration. Deep, radial valleys hinder movement; many flood plains are untrafficable except in summer. The Nidda River is fordable at only selected locations.

(14) Westerwald. This area is poor to unsuited for cross-country movement. Scattered areas of steep slopes in addition to numerous and often

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contiguous patches of dense forest generally limit offroad movement to small areas and short distances.

3. COVER AND CONCEALMENT

a. Numerous possibilities exist for cover from small-arms fire and concealment from aerial and ground observation in the numerous forested and built-up areas of the study area. Large areas of forests cover most of the hilly and mountainous regions; about half are evergreen and half deciduous and, in some areas, the two are mixed. Urban areas larger than 0.25 square kilometers are moderately to densely distributed in most of the area. The most densely populated urban areas are the suburbs of Koblenz, Mainz, and Frankfurt am Main. Other significant urban areas are Giessen, Hanau, Fulda, Bad Hersfeld, and Alsfeld.

b. The forests are mainly planted in blocks separated by access lanes; interspersed openings are common. The evergreen stands, mainly spruce, are up to 80 feet high, regularly spaced up to approximately 10 feet apart, with trunks periodically pruned up to 10 feet from the ground. The more mature stands of evergreens provide year-round concealment from aerial observation and some concealment to foot troops from ground observation. The deciduous stands, primarily beech, are 20 to 100 feet high, 6 inches to 3 feet in diameter, and irregularly spaced. Concealment from aerial observation is available only when these trees are in leaf from May through September. Some concealment from ground observation is available. The evergreen and deciduous stands have numerous trees that can be used by foot troops for cover from flat-trajectory, small-arms fire.

c. The best areas for cover and concealment for foot troops and mechanized forces are within the larger built-up areas. Numerous heavily built masonry and concrete buildings are available for cover from flat-trajectory fire, and both vehicles and foot troops can be concealed from ground and aerial observation within the buildings.

d. Only limited cover and concealment are available in the remainder of the region, which is largely cultivated to small grains, vegetables, hay, and some fruit orchards. Stone walls, farm and rural village buildings, embankments, and concrete railroad and road bridges would afford some cover and concealment.

4. CLIMATE

a. Climate in the operational area is primarily maritime in nature but modified at times by drier continental influences. Maritime air masses, which are more frequent in winter than other air masses, dominate the area of interest on an average of 10 to 20 days a month, often without interruption. About half are polar maritime cells from the north Atlantic, while the remainder are modified tropical maritime from the central

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Atlantic. There is relatively little regional variation in climate, but terrain features, such as mountains, steep escarpments, and winding river valleys, do affect certain climatic elements to some extent.

b. Generally speaking, winter is cloudy and frequently stormy, with moderate temperatures for this northerly latitude; summer is somewhat less cloudy and comparatively cool. Rainfall is heaviest in summer but is usually adequate for water supply and agricultural uses in all seasons. Relative humidity, regardless of location, tends to be very high. Winter is the season of the highest relative humidity, ranging from 70 to 80 percent. Summer, even with its moist northwesterly airflow, has a lower relative humidity because of convection. Surface winds are an important consideration in many types of operations. The low-level airflow over the area is most often westerly in all seasons--southwesterly in winter and northwesterly in summer; however, many deviations occur as a reflection of local terrain. Visibility is usually good during the summer months, with the exception of some restrictions caused by fog and haze during morning hours; however, this clears by late morning.³

c. Precipitation is influenced by several factors.

(1) Mean annual precipitation ranges from 380 to 438 millimeters (23 to 35 inches). Precipitation is abundant in all seasons, and serious droughts are rare. Altitude and, to a lesser degree, the exposure to prevailing winds are important factors in the quantity of precipitation. Orographic influences on precipitation are considerable, and all the major mountain ranges are regions of rather heavy precipitation. The mountain station, Wasserkuppe (at about 950 meters in the Hohe Rhon), is an excellent example. Regions shielded from both westerly and southwesterly winds receive relatively small amounts of precipitation. Frankfurt is an example of this.

(2) Winter.

(a) Winter precipitation is not particularly heavy except on the higher slopes. On the average, 127 to 203 millimeters (5 to 8 inches) of precipitation falls in winter, much of which is in the form of snow. Precipitation occurs on about 12 to 20 days a month at most locations.

(b) The formation of the first snow cover develops in November and remains until March, with snow depths in the winter months ranging from 102 millimeters (4 inches) in the lower elevations to about 1,020 millimeters (40 inches) in the higher elevations.

³For purposes of discussion in this section, winter is defined as December, January, and February; spring as March, April, and May; summer as June, July, and August; and autumn as September, October, and November.

(3) Summer is the season of maximum precipitation throughout the entire area. From 203 to 304 millimeters (8 to 12 inches) can be expected in this 3-month period in most locations. The afternoon showers of this season are often accompanied by thunderstorms. There is a general increase in thunderstorm activity in the more southerly areas. Thunderstorms that normally occur in the afternoons are occasionally accompanied by hail.

(4) In spring, precipitation is rather light, ranging from 25 to 76 millimeters (1 to 3 inches) at most stations for this 3-month period. Showers occur, but their frequency reaches a maximum in April; and, as summer approaches, these showers gradually decrease in frequency but increase in intensity.

(5) In autumn, there is a decrease in solar heating and a resultant decrease in convectional shower activity. In general, there is a decrease in the amount of precipitation from summer to autumn.

d. Temperature.

(1) Temperatures are seldom extreme, primarily because of the frequent flow of relatively warm air from the west or southwest and the lack of any nearby source of extremely hot or cold air.

(2) Daily minimum temperatures are generally observed just before sunrise, and maximum temperatures occur 1 to 3 hours after the sun has reached its zenith. Exceptions to this pattern may occur when there is an airmass change some time during the day. The daily variation is observed in all seasons but is most pronounced in summer and least pronounced in winter.

(3) Over most of the area, mean daily maximums in the winter are near 40° C (40° F). Mean daily minimum temperatures are near -40° C (25° F). The lowest extreme winter temperatures are usually recorded with invasions of continental air from the east, primarily in January or February. A temperature as low as -32° C (-27° F) has been recorded over the eastern corps area. At the other extreme, temperatures of 24° C (76° F) have been reached when southerly winds have brought warm air into the area. On an average, more than half the days of the winter months have temperatures below 0° C (32° F).

(4) In summer, mean maximum temperatures generally range between 18° C (65° F) and 24° C (75° F) over the area. The daily range of temperature is the greatest in this season. Minimum temperatures of about 0° C (32° F) have been recorded at all stations. Maximum temperatures equal to or greater than 30° C (86° F) generally occur 1 to 3 days per month at locations below 1,500 feet in the heart of the area.

(5) Spring and autumn provide a gradual transition in temperatures from winter to summer and from summer to winter. In general, autumn is

slightly warmer than spring as evidenced by slightly higher mean temperatures and somewhat fewer days with freezing temperatures. The difference is probably brought about by the strong influence of the water to the west, which has a marked temperature lag compared to land.

e. Relative humidity varies with the seasons.

(1) Mean annual relative humidities are fairly high in winter, ranging from the seventies into the eighties. Winter is the season of the highest relative humidities, which probably result from the colder temperatures and shorter days rather than from actual higher moisture content. In this season, mean monthly relative humidities vary from about 75 to 95 percent.

(2) Summer, with its moist northwesterly airflow probably has more moisture but, because of convection, higher temperatures, and longer days, the relative humidity is lower on the average than in winter. Mean relative humidities in summer range from 65 to 80 percent.

(3) Spring, especially the month of May, generally has the lowest recorded relative humidities. Autumn has higher relative humidities than summer, but not as high as those of winter. The low relative humidities of spring are a reflection of low cloudiness, long days with accompanying convection, and a reasonable amount of atmospheric motion. Autumn tends to be quieter, allowing the moisture to stratify more easily in the lower levels, resulting in higher relative humidities.

f. The low-level airflow over the area is most often westerly in all seasons--southwesterly in winter and northwesterly in summer. The resulting surface winds reflect this flow pattern to a great degree; however, many local deviations are caused by terrain differences. Calms tend to be quite frequent due to the sheltering effect in the valleys. Many of these valleys have local wind circulations, particularly at night when drainage from nearby hills and mountains takes place. Some valleys, if close to the major axis of windflow, tend to channel the wind, resulting in altered directions and higher velocities. There is a daily variation in windspeed in all seasons, but it is most pronounced in summer. Windspeeds generally reach maximums in the afternoon, in association with maximum solar heating.

(1) The strongest surface winds are observed during winter. These strong winds blow most frequently from a southerly, southwesterly, or westerly direction; rarely do they blow from the north or northeast. Winds, particularly in the daytime, are often moderate to fresh and sometimes strong. Occasional gales occur, usually in connection with frontal squalls. Winds over 28 knots usually occur on less than 1 day per month in this season.

(2) Windspeeds in summer are not as great as during the winter season. By summer, the low-pressure region around Iceland has practically

disappeared, while the Atlantic high-pressure system has moved northward with a ridge extending into the European Continent. The result is a more northwesterly circulation of airflow over the area. Gale-force winds are rather infrequent in summer; and, at low elevations, winds above 40 knots practically never occur. The highest windspeeds are recorded during the afternoon; and calm, light, variable winds are frequent during the night and early morning.

(3) Early spring and late autumn, like winter, are normally quite stormy; but spring generally has the highest windspeeds. Gusty winds from the north often accompany shower activity, particularly during April. By late spring, the prevailing wind direction has shifted to west and northwest. During both spring and autumn, winds equal to or greater than 28 knots occur on 0 to 3 days per month.

g. Fog is the primary cause of restrictions to visibility, with smoke and haze restricting visibility less. Fog has a marked seasonal pattern. Throughout the year, particularly in regions of complex terrain, considerable local variation can take place within short distances. In all seasons, visibility is usually at a minimum just before, at, and a little after sunrise.

(1) Most of the fog is radiation fog and, as such, is generally at a maximum near sunrise during the winter season. The area, with its relatively high latitude, has rather long nights in late autumn and winter. This provides the necessary radiational cooling to lower visibilities to less than $2\frac{1}{2}$ miles rather frequently. Visibility is reduced below $2\frac{1}{2}$ miles between 20 and 50 percent of the time at lower elevations and more frequently in cloud-enshrouded higher elevations.

(2) During summer, fog is infrequent and is generally confined to the hours around sunrise. As a result, visibilities are decidedly improved over those experienced in winter. There are some local departures from this average, notably at mountain locations where peaks remain cloud-enshrouded due to orographic instability and where industrial concentrations are affected by smoke. On the whole, however, this is the season of best visibilities. Visibility less than $2\frac{1}{2}$ miles occurs on an average of 2 to 10 percent of the time in summer.

(3) (a) During spring, the average occurrence of days with poor visibility is rather low. In March there is a rapid decrease in the frequency of days having visibility less than $2\frac{1}{2}$ miles. By the end of this season, days having visibility less than $2\frac{1}{2}$ miles are experienced only 2 to 5 percent of the time.

(b) Autumn, particularly late October and November, is the foggiest part of the year, though not necessarily the period of poorest visibility. Many of the characteristics of winter fog also apply to autumn; however, an additional consideration is the lighter winds that permit

greatest daily variation in low visibility experienced any time during the year, with most of the poor visibility occurring within an hour or two of sunrise.

h. The following tables provide specific weather data for the area of operations.

Table 1. Light Data.

Date	BMNT	BMCT	Sunrise	Sunset	EECT	EENT
14 Aug	0353	0439	0515	1949	2025	2111
15 Aug	0355	0441	0517	1947	2023	2109
16 Aug	0357	0442	0518	1945	2021	2106
17 Aug	0359	0444	0520	1943	2019	2104
18 Aug	0401	0445	0521	1942	2017	2102
19 Aug	0403	0447	0523	1940	2015	2059
20 Aug	0404	0449	0524	1938	2013	2057
21 Aug	0406	0450	0526	1936	2011	2054
22 Aug	0408	0452	0527	1934	2009	2052
23 Aug	0410	0454	0529	1932	2006	2050
24 Aug	0412	0455	0530	1930	2004	2049
25 Aug	0414	0457	0532	1928	2002	2045
26 Aug	0416	0459	0533	1926	2000	2042
27 Aug	0418	0500	0535	1924	1958	2040
28 Aug	0420	0502	0536	1921	1956	2037
29 Aug	0422	0503	0538	1919	1953	2035
30 Aug	0423	0505	0539	1917	1951	2033
31 Aug	0415	0507	0541	1915	1949	2030

Table 2. Mean Dates of First Formation and Final Melting of Snow Cover

Station & Elevation (ft)	Formation	Melting
Frankfurt am Main (358)	4 December	9 March
Fulda (892)	13 December	17 March
Kleiner Feldberg/Taunus (2,622)	NA	NA
Marberg an der Lahn	21 November	19 March
Neuwied	19 December	27 February

NA—Data not available.

Table 3. Mean Number of Days Per Year with Snow Cover at Specified Elevation in Specified Regions

Region	Elevation (feet above MSL)							
	600	1,000	1,300	1,600	2,000	2,300	2,600	3,000
Hohes Rhon	—	51	63	78	90	103	115	127
Spessart	30	44	58	70	—	—	—	—
Taunus	25	38	53	68	86	100	115	—
Vogelsberg	30	44	55	68	80	—	—	—

Table 4. Absolute Maximum Depths of Snow Cover (Inches)

Station & Elevation (ft)	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Frankfurt-Rhein/Main (367)	0	*	2	9	11	12	7	1	0	0
Fulda (892)	0	0	4	8	14	19	7	2	0	0
Kleiner Feldberg/Taunus (2,622)	0	8	13	24	29	44	26	22	*	0
Marberg an der Lahn (784)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neuwied (220)	0	0	2	4	9	10	2	*	0	0

NA—Data not available

* > 0 but < 0.05 inches

Table 5. Precipitation (Inches)

Station & Elevation (ft)		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Anl	Yrs Rec
Frankfurt am Main (358)	Greatest	3.7	3.4	4.0	4.0	4.5	5.3	4.9	8.4	4.3	6.7	4.6	4.6	35.0	40
	Mean	1.7	1.4	1.6	1.5	1.9	2.2	2.5	2.7	2.0	2.2	1.9	2.1	23.7	
	Least	0.5	*	0.1	0.0	0.2	0.5	*	0.6	0.1	0.2	0.6	0.6	14.1	
Fulda (892)	Greatest	3.9	2.6	3.7	4.0	6.3	6.1	5.6	5.6	4.1	5.9	4.1	3.9	30.4	40
	Mean	1.7	1.3	1.5	1.8	2.4	2.5	3.0	2.8	2.2	2.2	1.8	1.9	25.1	
	Least	0.6	*	0.2	*	0.5	0.3	0.6	0.3	0.4	0.2	0.3	0.2	17.3	
Kleiner Feldberg/Taunus (2,622)	Greatest	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	40
	Mean	3.7	3.3	3.1	2.7	2.6	3.2	3.8	3.9	3.2	3.9	3.2	3.8	40.4	
	Least	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Marberg an der Lahn (784)	Greatest	4.6	3.1	3.6	4.1	5.1	5.2	4.8	5.8	3.9	7.4	4.7	5.7	32.6	40
	Mean	2.0	1.6	1.7	1.7	2.0	2.3	2.7	2.5	1.9	2.4	2.0	2.3	25.1	
	Least	0.6	0.1	0.1	0.0	0.4	0.2	0.3	0.1	0.3	0.2	0.4	0.5	14.3	
Neuwied (220)	Greatest	3.3	4.0	2.6	3.9	5.6	5.9	5.6	4.6	5.0	5.6	3.3	3.9	29.6	40
	Mean	1.6	1.4	1.3	1.6	1.7	2.4	3.0	2.2	2.0	2.1	1.6	1.8	22.7	
	Least	0.6	0.3	0.2	0.0	0.3	0.8	0.2	0.6	0.2	0.1	0.4	0.4	12.7	

* > 0 but < 0.05 inches

NA—Data not available.

